



Project Study Report - PDS

02-SHA-5 PM 2.0/R12.0

20.XX.075.600

PPNO 3445

02 0002 0191

02-4C402

December 2011



REDDING TO ANDERSON 6-LANE • WIDEN TO 6 LANES





PROJECT LOCATION

In Shasta County in and near Anderson and Redding from 0.1 mile north of North Cottonwood Undercrossing to Bechelli-Churn Creek Overcrossing




Approval
Recommended:

 12-20-11
Date
PHIL BAKER, P.E.
Project Manager, District 2

 12-19-11
Date
DAVE MOORE, P.E.
Deputy District Director
Planning & Local Assistance, District 2
STIP Program Manager

Approved By:

 12/20/11
Date
JOHN BULINSKI, P.E.
District Director, District 2



advance
planning



caltrans district 2

Table of Contents

Registered Civil Engineer Stamp	iii
1. Introduction	1
2. Background	2
Local Involvement in Developing the Project	2
Table 1: Existing Freeway Features.....	3
Table 2: Freeway Interchanges	3
3. Purpose and Need Statement	4
4. Deficiencies	5
Table 3: 2010 and Projected Traffic Info	5
Crash Rates	6
Table 4: Existing Crash Rates	6
Primary Deficiencies - interchanges	8
Non-Standard Ramp Geometrics	8
Side Slope and Clear Recovery	9
The Clear Recovery Zone	9
Structures Issues	9
Table 5: Existing Structure Clearance	10
Advance Planning Studies	11
Drainage Issues	12
Location of Intelligent Transportation System (ITS) Elements	12
Field Review with Maintenance	13
5. Corridor and System Coordination.....	13
Transportation Concept Report – June 2008.....	14
Local Development Issues.....	14
Other Projects in the Area	15
6. Alternatives.....	15
Add all new lanes in the median.....	16
Keeping the median as wide as possible.....	16
Alternative A (VA 1.2)	17
Alternative B (VA 1.1) Preferred Alternative	20
Alternative B-1	23
Alternative B-2	23
Alternative B-3	24
Phasing Alternative C (segment) - (VA 2.3).....	25
Phasing Alternative D (segment) - (VA 2.1)	26
Phasing Alternative E (segment) - (VA 1.3).....	27
Phasing Alternative F (segment) - (VA 2.2)	27
Phasing Alternative G (segment) - (VA 2.4A)	28
Phasing Alternative H (segment) - (VA 2.4B).....	29
Value Analysis Alternatives.....	30
7. Follow Up Work During the Project Approval &Environmental Document Phase	30

Structures	30
Traffic Operations.....	30
Other Studies.....	31
Right of Way	31
8. Transportation Management.....	31
9. Right of Way	31
10. Non-Standard Design Features.....	32
11. Local Agency Involvement.....	32
12. Environmental Determination/Document	32
Anticipated Environmental Document	33
Special Considerations.....	33
Noise Impacts.....	33
Initial Site Assessment	33
Storm Water Data Report	33
13. Funding	34
Project Development.....	34
Construction.....	34
13A. Capital Cost.....	35
Table 6: Capital and Support Costs.....	35
Table 7: Fiscal Year and Funding Type	36
14. Schedule	36
15. Federal Highway Administration (FHWA) Coordination.....	37
16. District Contacts.....	37
17. Attachments.....	37

List of Tables

Table 1 - Existing Freeway Features.....	3
Table 2 - Freeway Interchanges.....	3
Table 3 - 2010 and Projected Traffic Info	5
Table 4 - Existing Crash Rates	6
Table 5 - Existing Structure Clearance	10
Table 6 - Capital and Support Costs.....	35
Table 7 - Fiscal Year and Funding Type	36

List of Figures

Figure 1 - Photo of 4-Lane Freeway	1
Figure 2 - Photo of Deschutes Road interchange to Balls Ferry Road interchange.....	8
Figure 3 - Photo of North Street Undercrossing.....	11
Figure 4 - Photo of retaining wall between Balls Ferry Road and North Street	18
Figure 5 - Photo of existing 6-lane freeway with 36-foot median.....	21

Registered Civil Engineer Stamp



This Project Study Report – Project Development Support has been prepared under the direction of the following Registered Engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.



DALE WIDNER

DALE WIDNER,
Registered Civil Engineer

19 DEC 11

Date

Project Study Report - PDS

Redding to Anderson 6-Lane

EA 02-4C402K
EFIS ID 02-0002-0191
PPNO 3445



Figure 1 – Looking north from the Riverside Avenue Interchange (Exit 670)

When the Sacramento River bridge was replaced in 2004, the median was decked as part of construction staging, which now makes widening the freeway to 6-lanes significantly simpler. The gap between existing 6-lane freeway segments from Anderson and Redding is 7 miles long. This project will close that gap.

1. INTRODUCTION

This Project Study Report – Project Development Support (PSR-PDS) proposes to close the 7 mile gap between existing 6-lane freeway segments from Anderson to Redding on Interstate 5 (I-5). Once this gap closing project is completed, I-5, with the heaviest traffic volumes north of Sacramento, will have over 15 miles of continuous 6-lane freeway.

Estimated Capital Construction Costs:	Roadway \$ 47 million Structures <u>\$ 13 million</u> Total \$ 60 million (2011) escalated to 2016= \$65 million
Estimated Capital Right of Way Costs:	\$111,000 (2011) escalated to 2015=\$130,000
Anticipated Funding Source:	2012 STIP and local funds for PA&ED, PS&E, and R/W (support and capital only)
Number of Alternatives:	11 plus no build
Alternative Recommended for Programming:	B – Add lanes in the median
Anticipated Environmental Determination:	CEQA – Initial Study / Negative Declaration NEPA - Categorical Exclusion
Performance Measures:	New Mixed Flow Lanes: 14 lane miles Bridge Rail Replacement/Upgrade: 1560 linear feet Widen Existing Shoulders: 14 linear miles
Project Program Category:	New construction STIP – 20.XX.075.600
Construction:	As early as summer of 2015 and 2016
Number of Structures Impacted:	3-pairs of structures of freeway lanes over local roadways 1-pair of structures of freeway lanes over a railroad 2-pairs of structures of freeway lanes over creeks/waterways <u>1-double box culvert</u> 7-total pairs of structures
Project Limits:	Overall: SHA-5-PM-2.0/R12.0 New Lanes Only: SHA-PM-R4.1/R11.2

2. BACKGROUND

Recent projects on I-5 in the Redding and Anderson areas have added a third lane each direction to the freeway segments with the highest volumes north of Sacramento. The Shasta County Regional Transportation Planning Agency (SCRTPA), Caltrans, and other local agencies are eager to connect the dots between the two projects and create a continuous 15 mile plus segment of 6-lane freeway. Congestion that reduces Level of Service (LOS) below the C/D threshold by 2030 is anticipated in this 7-mile segment if it remains as a 4-lane freeway. The local momentum to move forward now to connect the existing 6-lane projects is very high.

Past efforts to fund widening of mainline I-5 in Tehama and Shasta County included the “Fix Five Partnership” concept. That movement began in 2007 and ran through 2009, lead by the SCRTPA and the Tehama County Transportation Commission (TCTC), and had strong support from Caltrans with a mission of “Enhancing Capacity and Mobility Along the Interstate 5 Corridor.” One component of the Fix Five program would have added fees to local development projects to provide funds for widening the freeway in proportion to the I-5 traffic generated by the new development. The fee program was never approved for implementation by all the local agencies due to some opposition. However, the effort resulted in the SCRTPA Board's commitment of all of their Regional Transportation Improvement Program (RTIP) funds to the I-5 corridor provided state or federal grants can provide matching funds.

Local involvement in developing the project:

- The SCRTPA, City of Anderson, and Caltrans together developed the purpose and need for this project
- The top priority of the SCRTPA is the I-5 corridor from the Tehama/Shasta County line north to Mountain Gate near Lake Shasta

Project proponents include:

- Shasta County Regional Transportation Planning Agency
- City of Anderson
- Shasta County
- Caltrans

Table 1 includes the important freeway features.

Table 1: Existing Freeway Features							
		Begin Post Mile	End Post Mile	Length (miles)	Median Width* (Feet)	Segment	Comments
Total length of 15.2 miles	6-Lane freeway 3.00 miles	1.30	R4.30	3.00	36 - 60	Cottonwood Hill EA 02-37100	6-lane completed in 2011
	4-Lane freeway 3.95 miles	R4.30	R8.25	3.95	60	Includes elevated portion through Anderson	Gaps project connects the 6-lane freeway segments on each side
	4-Lane freeway 0.15 miles	R8.25	R8.40	0.15	60 - 84	Transition to wider median	
	4-Lane freeway 2.80 miles	R8.40	R11.20	2.80	84		
	6-Lane freeway 5.30 miles	R11.20	R16.50	5.30	60	South Redding 6-Lane EA 02-4C4014	6-lane completion planned in 2012

*Median width is expressed as the dimension between inside edges of traveled way, including the inside shoulder (in other words, "yellow stripe to yellow stripe").

15.2 Total Miles

In addition to the 6-lane freeway segments listed above (shown in blue), there is another 3.6 mile segment of 6-lane freeway on I-5 between north Redding and Shasta Lake City. See Attachment B for traffic volumes, locations of 4-lane and 6-lane segments, and interchange locations on SHA-5 from the Tehama/Shasta County line to Mountain Gate PM-0.0/R24.1.

Most of the interchanges in this segment are not full interchanges - meaning they do not provide for all four moves: northbound (NB) off, northbound on, southbound (SB) off, and southbound on. The following table includes all the interchanges within the project limits plus one beyond the limits of this project.

Table 2: Freeway Interchanges					
Exit Number	Road Served	Ramp Movements Provided	Post Mile (PM)	Distance between Interchanges (miles)	Local government jurisdiction and comments
667	Route 273	<ul style="list-style-type: none"> NB Off SB On 	3.8		<ul style="list-style-type: none"> City of Anderson Not a part of this project
				0.5	
667	Deschutes Road / Factory Outlets Drive	<ul style="list-style-type: none"> NB On SB Off 	4.3		<ul style="list-style-type: none"> City of Anderson NB Off and roundabout is planned to be constructed
				1.0	
668	Balls Ferry Road	<ul style="list-style-type: none"> NB Off SB On 	5.3		<ul style="list-style-type: none"> City of Anderson Split diamond half interchange –

Exit Number	Road Served	Ramp Movements Provided	Post Mile (PM)	Distance between Interchanges (miles)	Local government jurisdiction and comments
					combined with North Street to complete all 4 moves
				0.3	
668	North Street	<ul style="list-style-type: none"> NB On SB Off 	5.6		<ul style="list-style-type: none"> City of Anderson Split diamond half interchange – combined with Balls Ferry Road to complete all 4 moves
				1.1	
670	Riverside Avenue	<ul style="list-style-type: none"> NB Off NB On SB Off SB On 	6.7		<ul style="list-style-type: none"> City of Anderson
				3.1	
673	Knighton Road	<ul style="list-style-type: none"> NB Off NB On SB Off SB On 	9.8		<ul style="list-style-type: none"> Shasta County Major retail center is planned for northeast quadrant of this interchange
				2.4	
675	Bonnyview Road / Churn Creek Road/ Bechelli Lane	<ul style="list-style-type: none"> NB Off NB On SB Off SB On 	12.2		<ul style="list-style-type: none"> City of Redding Not a part of this project

3. PURPOSE AND NEED STATEMENT

Need:

Efficient traffic operations on I-5 are diminished by 5 existing interchanges that are in close proximity to each other. Interstate-5 was constructed in the mid-1960's with one full interchange and 4 partial interchanges all within 3 miles of each other. The conditions are further complicated by a rolling mainline profile (which limits sight distance at the ramps), and 13% truck traffic. These factors combine to reduce the operational effectiveness of the existing 4-lane freeway in the Anderson/Redding Corridor. In addition, a major truck stop is adjacent to the sixth interchange in the corridor with significant amounts of merging big rig trucks that are longer and slower than other vehicles. Maintenance and construction activities that require lane closures are limited to nighttime only (which is more expensive) because daytime lane closures would cause immense delays.

The area adjacent to the corridor has significant development potential that will only add to the existing traffic inefficiencies. In addition, interregional traffic is projected to continue to grow over time. Level of Service (LOS) is projected to drop below the route concept of C/D by 2030 for the entire 7-mile gap between the existing 6-lane freeway segments.

Purpose:

1. Improve operations, improve safety, reduce delays on I-5 by reducing merge conflicts
2. Reduce congestion
3. Provide LOS C in year 2030
4. Improve safety for users and workers

4. DEFICIENCIES

Table 3 below shows the existing and projected traffic volumes. Note the difference between the actual and “Projected 2010 Volumes” from the Shasta County Regional Travel Demand Model developed by the Shasta County RTPA. This model is the tool that the Federal Highway Administration (FHWA) requires regions use that are covered by a Metropolitan Planning Organization (Shasta County RTPA). The projected data is from District 2 Office of System Planning, which made adjustments to the year 2030 projections in November 2011, based on the lower than expected growth from 2005 through 2010 and reduced interregional traffic.

Table 3: 2010 and Projected Traffic Info*									
Postmile			Description	Projected 2010 Volumes	Actual 2010 Volumes	Peak Hour	Level of Service (LOS)	Projected 2030 Volumes	Year 2030 (LOS)
R3.8	R4.3	6-Lane	Route 273 Jct. to Deschutes Road	63,000	51,000	4,900	C	82,000	C
R4.3	R6.7	4-Lane	Deschutes Road to Riverside Avenue	60,000	50,000	4,750	C	83,000	E
R6.7	R9.8	4-Lane	Riverside Avenue to Knighton Road	61,000	49,500	4,550	C	78,500	D
R9.8	R11.2	4-Lane	Knighton Road to Smith Avenue OC	65,000	51,000	4,700	C	78,000	D
R11.2	R12.2	6-Lane	Smith Avenue OC to Churn Ck Road	65,000	51,000	4,700	C	78,000	C

* Total volumes – northbound and southbound combined Average Annual Daily Traffic (AADT)

Traffic volumes projected by the model have not been realized because anticipated future development (that the agencies anticipated back in 2006 would occur by 2010) did not occur. Interregional volumes have dropped statewide as well.

See Attachment B for traffic volumes, locations of 4-lane and 6-lane segments, and interchange locations on SHA-5 from the Tehama/Shasta County line to Mountain Gate PM-0.0/R24.1. Reviewing Attachment B shows three existing segments of 6-lane freeway separated by two gaps of 4-lane freeway. This project is addressing the roughly 7-mile long gap from PM-R4.3 to R11.2 (basically, from Deschutes Road UC to Smith Road OC). The

other gap (called the “northern gap”) is from PM-R15.4/R18.7 (basically, from the Route 44 connection to the Route 273 interchange) with the southbound limits over one mile longer than the northbound gap. Traffic volumes are virtually the same for the entire Redding to Anderson 6-Lane portion of the northern gap between Route 44 and Route 299. However, Average Annual Daily Traffic (AADT) volumes drop off significantly north of Route 299, to as low as 33,000 AADT vs. about 50,000 AADT for most of the Redding to Anderson 6-Lane limits.

Crash Rates

Table 4 below shows reported crash rates for the 5-year period from January 1, 2005, through December 31, 2009, are generally below the statewide average for similar facilities. Crash rates are shown by mainline I-5 and each ramp separately. Details on mainline I-5 crashes are also shown.

Mainline I-5 crash details

- 367 total reported crashes
- 4 fatal crashes
- 125 injury crashes
- 238 property damage only

Other crash info

- 84 of 367 crashes started as vehicle running off the road
- 54 were coded as overturned
- 100 were rear end accidents
- 72 were sideswipes
- 2 were head on crashes

District 2 Traffic Investigations looked into the four fatal crashes on mainline I-5 in more detail and determined that all four accidents were random and do not share similar type or accident patterns that could be correctable with additional improvements.

Table 4: Existing Crash Rates						
Crash Rates*	Actual			Statewide Average		
	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
Mainline I-5 Only *accidents per 100 million vehicle miles						
Mainline I-5 Only	0.8	14	39	0.4	23	70

Crash Rates*	Actual			Statewide Average		
	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
On Ramps and Off Ramps Only *accidents per 100 million vehicles						
Deschutes Road – Exit 667						
NB on ramp	0	0	26	.2	26	75
SB off ramp	0	36	59	.4	42	120
Balls Ferry Road – Exit 668						
NB off ramp	0	37	49	.4	42	120
SB on ramp	0	50	50	.2	26	75
North Street – Exit 668						
NB on ramp	0	38	50	.2	26	75
SB off ramp	0	38	175	.4	42	120
Riverside Avenue – Exit 670						
NB off ramp	0	40	80	.4	42	120
NB on ramp	0	53	88	.2	26	80
SB off ramp	0	175	394	.4	42	120
SB on ramp	0	23	46	.2	26	75
Knighton Road – Exit 673						
NB off ramp	0	0	26	.4	42	120
NB on ramp	0	16	78	.2	26	75
SB off ramp	0	17	67	.4	42	120
SB on ramp	0	27	107	.2	26	75

The high crash rate at the southbound off ramp to Riverside Avenue (Exit 670) was due to intersection crashes at Riverside Avenue. District 2 Traffic Investigations studied the crashes and installed all-way stop control at the intersection in 2011. In addition, Traffic recommends removing the large concrete island for right turns at the southbound off ramp sometime in the future. That additional work has been included in the scope of work for this project.

The Fatal + Injury (F+I) crash rate is roughly double the statewide average at three of the on ramps: Balls Ferry southbound on ramp, North Street northbound on ramp, and the

northbound on ramp at Riverside. All three on ramps meet design standards. Combined, those three ramps had a total of 13 crashes, 12 of which involved more than one vehicle, with 10 of the crashes resulting in an injury. All but one of the 13 crashes were related to the intersections at the local road(s).

Primary deficiencies – interchanges:

- The three local road partial interchanges in Anderson do not meet user expectation because all four moves are not provided (off and on NB plus off and on SB)
- Addressing these interchanges is beyond the scope of this project

Non-Standard Ramp Geometrics:

The northbound on ramp from Deschutes Road has non-standard geometrics. The non-standard features include:

- Acceleration lane is 780 feet vs. standard of 1067 feet
- Right shoulder has a pinch point at the end of the bridge of 3 feet vs. standard of 8 feet

This ramp will be upgraded to standard geometrics with this project.

Heavy merge/diverge at Deschutes Road to Balls Ferry Road segment



Figure 2 Deschutes Road interchange to Balls Ferry Road interchange

The short distance between interchanges, heavy local traffic, rolling mainline profile, and steep on ramp profile grades combine to have a negative impact on main line operations

- Significant local traffic uses the freeway to go over the railroad between these two interchanges (traffic studies needed to verify numbers)
- The railroad divides the town here
- Weaving length between the on ramps and off ramps is 3150 feet for both the northbound and southbound directions
- Profile grade for the northbound on ramp from Deschutes is steep (+5.13%) and fairly short which has a negative impact to mainline operations
- The slight curve in mainline geometrics and the rolling mainline profile at the point of merger has a negative impact on operations by limiting sight distance for merging drivers
- Grades on the freeway plus heavy local traffic cause congestion and weaving on this segment

Side slopes and clear recovery:

- Entire project limits is built on fill
- Fill slopes are 2:1 from PM-R4.1 to R5.8 (horizontal to vertical)
- Fill slopes are roughly 4:1 for the rest of the project limits PM-R5.5 to R11.2
- New construction standards for cut and fill call for 4:1 or side slopes or flatter, with 6:1 or flatter preferred on high speed facilities such as I-5

The Clear Recovery Zone (CRZ) is the relatively flat (4:1 or flatter) area beyond the edge of traveled way which affords the drivers of errant vehicles the opportunity to regain control.

- CRZ should be free of fixed objects
- CRZ in fill areas of 2:1 side slopes is 13 feet
- Clear recovery in the median is reduced by the location of the median barrier
- Clear recovery in other areas is 30 feet or more
- New construction standards for freeways call for a minimum of 30 feet for clear recovery

Structures Issues

Existing structure clearance is shown in Table 5 below. Major new work is planned on all structures listed above the heavy line in the table. No work is planned on the four structures below the heavy line. Design standards call for new or widened structures to provide a minimum of 15 feet of clearance over local roadways and 23 feet minimum clearance over the railroad.

Table 5: Existing Structure Clearance

PM	Bridge (Official Bridge Name)	Bridge Number	Minimum Vertical Clearance (Feet – Inches)	Upper Facility	Lower Facility
These structures will all require widening to add lanes to I-5					
R4.3	Deschutes Road Undercrossing (UC)	06-0145L	15-0	I-5	Deschutes Road
R4.3	Deschutes Road UC	06-0145R	15-11		
R4.6	South Anderson Overhead (OH)	06-0098L	-	I-5	Union Pacific Railroad
R4.6	South Anderson OH	06-0098R	23-2		
R4.9	Anderson Creek Overflow*	06-0168	-	I-5	Anderson Creek
R5.0	Anderson Creek	06-0142L	-	I-5	Anderson Creek
R5.0	Anderson Creek	06-0142L	-		
R5.3	Balls Ferry UC	06-0140L	14-9	I-5	Balls Ferry Road
R5.3	Balls Ferry UC	06-0140R	15-10		
R5.6	North Street UC	06-0141L	14-6	I-5	North Street
R5.6	North Street UC	06-0141R	14-8		
R5.9	Tormey Drain	06-0144L	-	I-5	Tormey Drain
R5.9	Tormey Drain	06-0144R	-		
No work is planned on the following structures					
R6.7	Riverside Avenue Overcrossing (OC)	06-0146	16-1	Riverside Avenue	I-5
R7.0	Sacramento River	06-0128	-	I-5	Sacramento River
R9.8	Knighton Road OC	06-0134	16-3	Knighton Road	I-5
R10.9	Smith Road OC	06-0138	16-1	Smith Road	I-5

* Anderson Creek Overflow is a concrete box culvert – it will only need widened if outside lanes are added to I-5

Note that three bridges already have less than 15 feet clearance over the local roadways. Standards call for those to be upgraded to 15 feet if possible, or at a minimum improved as much as practical. A design exception is required if they cannot be upgraded to 15 feet of clearance. Upgrading the clearances is included in the scope of work for this project. This issue has been discussed with Jim Deluca, Caltrans Project Development Coordinator. He concurs with this statement.

The structure depth will be 2 inches deeper for a widened I-5 structure, further reducing the vertical clearance. New more stringent, Load and Resistance Factor Design (LRFD) standards require the widened portion of these structures to be 2 inches deeper than existing. Both locations of the above bridges originally had clearances over 15 feet but have been reduced by subsequent asphalt overlays of the local road. It is anticipated standard clearance and stopping sight distance can be obtained by lowering the crown of the lower roadway by grinding and/or removing some of the excess pavement and replacing the structural section as needed.

It is expected that the crown can be lowered without impacting existing curb, gutter, and sidewalk, and existing utilities, and with no change to existing drainage patterns on the local street. Verification by corings of the pavement will be required during the design phase.

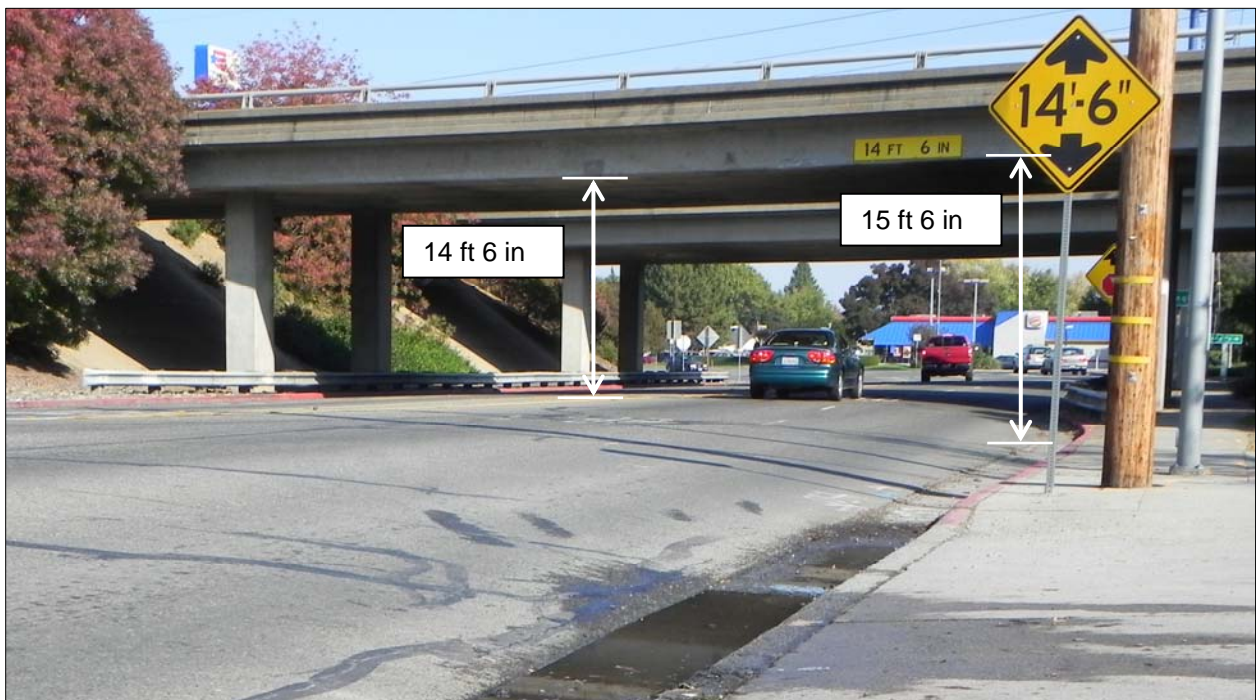


Figure 3 North Street Undercrossing – looking east

Point of minimum vertical clearance (14 ft 6 in) is at the centerline of North Street. Clearance is much greater at the edge of pavement (15 ft 6 in).

Advance Planning Studies

Normally, a Structures Advance Planning Study (APS) is not obtained during the PSR-PDS phase. However, since this project has a total of 6-pairs of structures plus a box culvert that would need to be widened, the project development team decided an APS level investigation would be appropriate. A generic APS was prepared for the Balls Ferry Undercrossing (see Attachment C). This study, combined with engineering judgment, was used as the basis for

scope and cost at all the locations. Advance Planning Studies will be required on all structures during the design phase.

Additional efforts to deck the median is cost effective vs. widening only the amount needed for inside widening (again, see Attachment C). Fewer columns are needed to deck the median vs. widening both structures separately (total of 4 columns vs. a total of 8 columns). See the APS for more info.

Drainage Issues:

- Localized flooding has occurred in the state right of way at Factory Outlets Drive/Deschutes Road per the preliminary hydraulic review
- Some drainage retention/detention facilities may be required because of the increased impervious area needed to add lanes
- No other major drainage deficiencies have been identified at this time
- More drainage info is included in the project files

Location of Intelligent Transportation System (ITS) Elements

This corridor has a number of existing and proposed ITS elements within the right of way that may be in the way of proposed widening, including a bundle of fiber optic lines that were added in the median in 2011. Many ITS elements have a fairly limited useful life due to exposure to water, humidity, corrosion, freezing, and overheating.

The most likely useful life of various elements of the ITS network are as follows:

- Fiber optic lines in conduit – 50 years + useful life
- Cabinets, poles, concrete pads, and other non-electronic elements – 20 to 30 years
- Electronics inside the cabinets, cameras and such – up to 10 years
- Connecting wires inside the cabinets – 5 years or so

Fiber optic line vaults are located every ¼ mile and will need to be adjusted to grade if widening happens in the median. Bridge widening in the median through Anderson will cause about three miles of fiber optic lines to be relocated.

ITS elements will be located/relocated to a position that will avoid foreseeable future projects.

Field Review with Maintenance

Marty Wimer, Maintenance Supervisor, Redding North, attended a field review of the project on November 29, 2011.

The scope of work includes the following “maintenance friendly” features based on the field review:

- Pave all areas in the median that are not mower and trash collection friendly
- Typically, the 15 foot wide mower needs room to work without encroaching onto the shoulder
- Pave all narrow median areas that require trash pick-up with a sweeper to avoid using hand crews
- No new landscaping will be added
- Maintenance typically mows two or three times per year
- Mowing is limited to areas that a pickup truck can also drive to put out any fires that may get started by the mower
- Maintenance typically runs the 8 foot sweeper about 6 times per year
- The manual calls for sweeping whenever one cubic yard of material (trash) can be collected in one mile – District 2 crews try to do better than that
- Trash collects more against solid walls and barriers than other areas
- Include breaks in the median barrier with paved crossovers for maintenance and California Highway Patrol (CHP) access

The following work item is not included in the scope of this project, but should be considered when future projects are constructed.

- Extend the northbound on ramp from Knighton Road to allow trucks more acceleration – situation only for northbound direction – not southbound
- The on ramp meets design standards, however the large number of trucks that use the ramp causes operational issues

5. CORRIDOR AND SYSTEM COORDINATION

This project is located on Interstate 5 (I-5) between two recent widening projects; Cottonwood Hills climbing lanes and South Redding 6-lane projects in Shasta County that widened those segments to 6-lanes. I-5, a north-south route, is a principal arterial at this location. I-5 is a high emphasis route, and a part of the National Highway System (NHS) and the Interregional Road System (IRRS). The current facility is a four-lane freeway with standard twelve-foot lanes, ten-foot outside shoulders and five-foot inside paved shoulders. The project proposes to add a mixed flow lane in both directions, widen the inside shoulder

to ten feet, closing the “gap” between the six lane segments of freeway immediately to the north and south.

Transportation Concept Report - June 2008

The project is consistent with State and local transportation plans and programs. The 2004 Shasta County Regional Transportation Plan (RTP) addresses the need to add lanes at this location. Based on the forecast traffic growth in this area, the 2008 Transportation Concept Report states that the twenty-year facility concept at this location is a six-lane freeway with twelve-foot lanes, ten-foot outside shoulders and ten-foot inside shoulders. The post twenty-year concept in this area is an eight-lane freeway.

Bicycles and pedestrians are not allowed to use this segment of freeway.

Local Development Issues

Three major planned projects within the limits of this proposed project could impact this freeway segment.

New northbound off ramp to the Deschutes Road interchange (Exit 667B):

- City of Anderson is the project sponsor (EA 02-347600, EFIS 02-0000-0251, PPNO 3488)
- Capital costs are \$6 million for the project
- Includes a new northbound off ramp and a roundabout for the northbound ramps
- Purpose of the project is to provide improved access to existing commercial and industrial lands

Knighton Road and the proposed Churn Creek Commons Commercial Center:

- Rezone 92 acres from agriculture to up to 740,000 square feet of commercial at the northeast quadrant of the Knighton Road interchange (Exit 673)
- Significant amounts of new traffic is anticipated with the proposed retail center
- Construction schedule has not been set due to legal challenges

Stillwater Business Park – City of Redding:

- Located adjacent to the east side of the Redding Airport, about 2-3 miles east of I-5
- Currently no tenants in the newly opened 700 acre business park
- Freeway interchanges impacted – Balls Ferry / North Street (Exit 668), Riverside (Exit 670), Knighton (Exit 673), and Churn Creek / Bonnyview (Exit 675)

Other Projects in the Area

Structures

Each structure within this corridor is scheduled to receive routine maintenance in the next few years. Planned and programmed work includes the following:

- Joint seal replacements at all mainline bridges within the corridor
- Remove and replace the polyester concrete overlay at the South Anderson railroad overhead (Bridge #06-0098 R/L)
- There are no structural issues, other than minor routine maintenance, with any of the bridges in this corridor
- No scour issues at the bridges have been identified

Maintenance – Highway Maintenance 124 Pavement Preservation Program (20.80.010)

Name:	SHA-5 Gap
Post Mile limits:	SHA-5-PM-R4.3/R11.2
Capital Cost:	\$2.8 million
Construction Year:	Summer 2013 or 2014
EA:	02-5E060
Scope of Work:	Remove and replace existing open graded wearing course – New open graded to be placed from edge of pavement (EP) to edge of pavement
Service Life:	4 to 7 years of service life is needed

Construction of this widening project needs to be coordinated with the above listed maintenance project so that it will allow for 4 to 7-years of service life, per Lance Brown, Chief, District 2 Maintenance.

6. ALTERNATIVES

A Value Analysis (VA) study has been completed recommending adding a mixed flow lane by widening to the median, no replacement of structures, and consideration of an auxiliary lane between Deschutes and Balls Ferry interchanges pending results from a traffic analysis. Those concepts are included in the alternatives considered.

This PSR-PDS includes a total of 11 variations. Many of the variations come directly from the VA efforts. All have advantages and disadvantages listed. All of them are safe, cost effective, and reliable.

For now, programming assumptions have been made based on Alternative B – the baseline project.

Two main design strategies are being considered – 1) all additional mixed flow lanes in the median, or 2) a combination inside and outside widening to maintain the 60 foot median where we have it.

Add all new lanes in the median

- Standard, safe, and efficient project - construction is simple and cost effective
- Very strong support among transportation partners for this concept
- Contractors are eager to lower their bids for this type of work – all their work in one spot, protected by K-rail on both sides
- Bridge construction to deck the median between the 6-pairs of bridges is efficient
- Environmental clearance is simple because most of all the work is on ground that has already been shaped into the median and new lanes are farther away from houses
- Minimize sound impact concerns
- Adding lanes in the median simplifies design
- Structural section is not as substantial for a new lane in the median based on TI=12.0 vs. TI=14.5 for widening on the outside – since far fewer trucks will use the new number 1 lane (TI=Traffic Index)

Keeping the median as wide as possible

- Enhanced safety benefits over all widening in the median because of increased clear recovery distance to the barrier
- Median barrier crash rates, a subset of the overall crash rate, increase significantly as the offset to the barrier decreases (offset is defined as the distance to the median barrier from the edge of traveled way)
- A 2006 research study on Pennsylvania Interstates showed median barrier crash frequency was reduced by 3.5% per foot of increased offset (log-linear rate) to the barrier (Donnell, E.T., Mason Jr., J.M. 2006. Predicting the frequency of median barrier crashes on Pennsylvania interstate highways. Accident Analysis and Prevention 38 (2006) pp. 590-599.)
- Median barrier crashes in the Pennsylvania study showed 0.7% fatal, 56% injury, and 43.3% property damage only
- A 36-foot median with concrete barrier on centerline has a 17-foot offset to the barrier, and a 60-foot median with cable barrier has a 30-foot offset to the barrier

- A 70-foot median is proposed in Anderson (which has a 35 foot offset), which suggests a 47% decrease in median barrier crash rates over a 36-foot median (based on the log-linear rate)

A diverse range of construction alternatives are included in this report to capture variable funding options.

Options include:

- No build alternative
- Project could be built all at once (7-miles) or in shorter segments that are phased improvements (see Attachment E)
- Six different options to build a phased improvement that do not close the gap ranging in length from 0.8 miles to 6.0 miles
- Construction on the shorter segments would be built exactly the same as the longer segments, just for shorter limits
- Capital construction plus right of way costs range from \$15.4 mil for a phased short segment to \$72.5 mil which closes the gap (2011 values-no escalation)
- Meets most mandatory and advisory design standards for mainline I-5
- VA alternative and recommendations

See Attachment D for a table comparing cost and features for all 11 Alternatives.

Alternative A (VA 1.2)

Capital Construction Cost:	\$72 Mil
Capital Right of Way Cost:	\$578,000

Maintain wide median (60 to 70 feet)

PM-R4.1/R11.2

Project length 7.1 miles

Features on I-5 include:

- All mandatory and advisory design standards on I-5 mainline are met – with the exception of interchange spacing (Topic 501.3) and left shoulder slope (Topic 302.2)
- Close entire gap but does not reduce the existing median for maximum clear recovery
- Outside widening from PM-R4.1/R8.3 through Anderson, then inside widening from PM-R8.3/R11.2
- Net result is an unpaved depressed 70-foot median through Anderson, 60-foot median everywhere else

- Except at the recently rebuilt Sacramento River bridge and adjacent Riverside Avenue interchange where median width will be 36 feet
- New right of way will be required – but no improvements will be impacted
- Retaining walls (see Figure 4, below) including aesthetic treatments (not shown) to protect development in the elevated portion between Balls Ferry Road and North Street
- Existing cable median barrier will remain
- Anticipated 12-foot high sound walls to protect homes west of PM-R7.8/R8.3 and east of PM-R8.0/R8.3
- All bridges widened to the outside as needed plus overlay with polyester concrete
- Provide three 12-foot lanes plus 10-foot inside and outside shoulders
- Three off ramps gores and three on ramp gores will need to be modified as needed
- Upgrade to standard existing non-standard northbound on ramp geometrics at Deschutes Road
- Overlay the existing pavement from EP to EP with open graded asphalt
- Drainage systems modified as needed
- Drainage retention/detention facilities added as needed
- Existing ITS and other improvements maintained or modified as needed



Figure 4
Retaining wall typical between Balls Ferry Road and North Street in Anderson

Features on local roads include:

- Lower Balls Ferry Road under the southbound I-5 bridge by 3-6 inches by grinding / replacing the structural section to provide 15 feet of vertical clearance (Bridge #06-0140L)

- Lower North Street under both I-5 bridges by 6-9 inches by grinding / replacing the structural section the North Street pavement to provide 15 feet of vertical clearance (Bridge #06-0141L and 06-0141R)
- Both of the above bridges originally had clearances over 15 feet but have been reduced by subsequent asphalt overlays of the local road
- No anticipated impacts to utilities, drainage, or existing curb, gutter, and sidewalks
- Verification by corings of the pavement will be required during the design phase
- Standards for existing intersection spacing for the local roads at freeway off ramps are not being addressed with this project because the local road interchanges are not undergoing major reconstruction

Earthwork - Local borrow material from cuts at Cottonwood Hill

- PM-2.85/3.50 right of northbound lanes
- Widen clear recovery in cut from existing 17 – 20 feet to 30 feet or more
- Existing cut slopes are at 2:1, with heights from 20 to 35 feet high
- Proposed cut slopes at 2:1
- No new right of way needed for local borrow
- Plenty of local borrow material is available at this site
- Local borrow site can be used for all build options

Discussion:

- Maintaining a wider median allows for more clear recovery and less crashes
- Sound walls were not included in the outside widening segment in the downtown district because increased freeway visibility for the businesses was deemed to be a higher priority than reducing sound – if that is not the case, then add sound walls here as well
- Mature landscaping will be replaced
- Increasing vertical clearance to 15 feet over local roads is presumed to be possible by grinding/replacing the structural section at the crown without impacts to curb and gutter, drainage, and utilities
- The proposed northbound off ramp and roundabout at Deschutes Road interchange (Exit 667B) will not be impacted other than at the ramp gores, as mentioned above

Advantages:

- Expected median barrier crash rates reduced by 47% with wider median (70 feet vs. 36 feet)
- Side slopes will be upgraded to 6:1 or flatter which improves clear recovery
- Consistent median width throughout the corridor is desirable for driver comfort
- Closing the gap provides over 15 miles of continuous 6-lane freeway from Cottonwood to Redding
- Getting all the construction completed in one project limits the number and amount of time traffic must deal with work zones and saves money

- Maximizes use of existing facilities and bridges
- Minimum impacts to local businesses
- New right of way will be limited to vacant land purchases which will never be more cost effective than now
- Ultimate widening to 8-lanes can be done without additional right of way

Disadvantages:

- Construction is harder for the contractor because his work area is split up – therefore higher bid prices will result
- Transportation partners do not support this concept
- Staging and constructability more difficult than Alternative B
- Mature trees and other landscaping will be removed between Balls Ferry Road and North Street. The area will all be replanted, but will take 5-10 years to mature
- Will take longer to reach Project Approval & Environmental Document (PA&ED) milestone and Right of Way Certification
- Support costs will be higher due to increased project complexity
- Requires more structural section through Anderson (27 feet new vs. 22 feet new for PM-R4.3/R6.5)
- Outside widening portion will require stronger structural section (TI=14.5 vs. TI=12.0 for inside widening) because trucks use the outside lanes (TI=Traffic Index)
- Project is slightly longer than Alternative B due to transition to outside widening

Alternative B – (VA 1.1) Preferred Alt

Capital Construction Cost:	\$60 Mil
Capital Right of Way Cost:	\$130,000

**Baseline Alternative – Widen entirely in the median
PM-R4.3/R11.2
Project length 6.9 miles**



Figure 5 Existing 6-lane freeway with 36-foot median, concrete barrier on a paved “tent” section
This segment of I-5 between Redding and Shasta Lake City is exactly what Alternative B would look like.

Features on mainline I-5 include:

- All mandatory and advisory design standards met – with the exception of interchange spacing (Topic 501.3)
- Close entire gap by widening in the median to match recent Cottonwood Hill widening and South Redding 6-Lane widening projects
- Net result is 3-lanes in northbound and southbound directions with 10-foot inside and outside paved shoulders
- Concrete median barrier on a paved “tent” section will be added for the 4.2 miles where the after project median width is of 36 feet (PM-R4.1/R8.3) exactly like is shown in the photo (see Figure 5, above)
- Cable barrier on an unpaved depressed section will be added for the 2.9 miles remainder of the project where after project median width is 60 feet (PM-R8.3/R11.2)
- The six pairs of I-5 bridges in Anderson will be widened in the median plus overlay with polyester concrete
- Bridge widening will connect each pair of bridges to create one wide bridge at each site – in other words “deck the median”
- Upgrade to standard existing non-standard on ramp geometrics at Deschutes Road by shifting northbound mainline about 5 feet to the median at the on ramp gore
- Overlay the existing pavement from EP to EP with open graded asphalt

- Drainage systems will be modified as needed
- Drainage retention/detention facilities will be added as needed
- Existing ITS and other improvements will be maintained or modified as needed

Features on local roads include:

- Same as Alternative A for local road features

Earthwork - Local borrow from cuts at Cottonwood Hill

- Same as Alternative A for local borrow

Disposal Sites – flatten fill slopes instead

- Excess earthwork material is proposed to be reused on the job to flatten existing fill slopes to 6:1 or flatter
- Intent is to maximize the clear recovery within the project limits to 6:1 or flatter where right of way is available
- Flatter slopes are easier to maintain, are storm water friendly, and provide for maximum safety for errant motorists

Advantages:

- Best Value alternative from the Value Analysis study
- Matches existing widening projects on either end
- Very strong support among transportation partners for this concept
- Closing the gap provides over 15 miles of continuous 6-lane freeway from Cottonwood to Redding
- Cost effective to construct all improvements in the median – most work will be shielded by K-rail
- Maximizes use of existing facilities and bridges
- Decking the median on bridges is efficient – only two columns needed for each end of the bridge – see Attachment C
- Getting all the construction completed in one project limits the number and amount of time traffic must deal with work zones
- Minimum impacts to local businesses

Disadvantages:

- Higher expected median crash rates (47% higher) with narrow median (36 feet vs. 70 feet)
- Ultimate widening to 8-lanes requires some outside widening and new right of way at a higher cost if development occurs

Three variations to Alternative B are included below:

These are essentially the same alternative as Alternative B, but with design variations as noted.

Alternative B-1

Capital Construction Cost:	\$71 Mil
Capital Right of Way Cost:	\$130,000

Alternative B-1 Inside widening – replace Deschutes UC

Same as Alternative B but includes a replacement of the Deschutes Undercrossing with a new longer single span structure instead of widening the existing

Advantages:

- Longer structure allows Deschutes Road to expand to 4-lanes plus full shoulders and sidewalks
- New bridge will have longer life

Disadvantages:

- Reconstruction of about one mile of I-5 due to profile changes because new bridge would be longer and deeper
- Not able to lower the profile of Deschutes Road

Alternative B-2

Capital Construction Cost:	\$58 Mil
Capital Right of Way Cost:	\$130,000

Alternative B-2 Inside widening – don't deck the median

Same as Alternative B but does not deck the median between the each bridge pair. An advisory design exception is required.

Advantages:

- Bridge pairs are only widened the amount needed for the new lane and a wider shoulder – a total of 17 feet for each bridge

Disadvantages:

- Requires an advisory design exception
- Reduced clear recovery zone
- Requires two new bridge rails instead of one

Alternative B-3

Capital Construction Cost:	\$54 Mil
Capital Right of Way Cost:	\$130,000

Alternative B-3 Inside widening – cable barrier in 36 foot median

Same as Alternative B but uses a cable barrier on an unpaved depressed median in the 36 foot median segment instead of a concrete barrier on a paved tent section

Advantages:

- Significantly lower cost to use the cable instead of concrete barrier over pavement
- Post spacing can be decreased to reduce impact deflection

Disadvantages:

- Guidance and Kristi Westoby, District Traffic Safety Engineer, call for concrete median barrier
- Maintenance prefers concrete median barrier – with virtually no maintenance required
- Narrow unpaved median is harder to maintain

Phasing alternatives C through H are partial segments which were developed to capture smaller funding amounts but do not individually close the gap completely between the existing 6-lane segments. The alternative recommended for programming remains Alternative B. These phasing alternatives (partial segments) will only be considered if full funding to close the entire 7-mile gap is not available. The partial segments improve mainline operations, congestion, LOS, and safety – though not as much as Alternatives A, B, B-1, B-2, and B-3, since they do not close the gap completely between existing 6-lane freeway segments.

Phasing Alternative C (segment) – (VA 2.3)

Capital Construction Cost:	\$15 Mil
Capital Right of Way Cost:	\$400,000

Aux Lane

PM-R4.35/R5.15

Project length 0.8 miles

An auxiliary lane is an extra lane added to the existing through lanes used for weaving and speed change, typically added between an on ramp and an off ramp.

Features on I-5 include:

- Aux lane added to the outside of existing lanes between the Deschutes Road interchange and Balls Ferry Road interchange in both northbound and southbound directions
- The aux lanes begin with the on ramp in each direction and end at the following off ramp with a mandatory exit (trap lane)
- Existing cable median barrier will remain
- Anticipated 12-foot high sound wall to protect homes east of PM-R4.5
- Bridges widened to the outside as needed
- Upgrade to standard existing non-standard on ramp geometrics at Deschutes Road
- Overlay existing pavement from EP to EP with open graded asphalt
- Drainage systems modified as needed
- Drainage retention/detention facilities added as needed
- Existing ITS and other improvements maintained or modified as needed

Discussion:

- Addresses the existing operational issue
- Does not impact future median widening
- Detailed traffic studies are needed to determine the effectiveness of the proposed auxiliary lanes between Deschutes Road and Balls Ferry Road interchanges vs. an additional through lane each direction

Features on local roads include:

- No work planned on local roadways

Advantages:

- Lower cost solution to improve an existing weaving problem at this location

- Focused improvements on the 0.8 mile segment with the highest current peak hour volumes (4750) of all segments in the entire 7 mile gaps project
- Can be designed separately from other widening

Disadvantages:

- Does not provide the same operational improvements and reduced congestion that closing the entire gap between 6-lane segments would provide
- Requires a separate project or projects down the road to finish closing the gap which will disrupt traffic again, and cost more due to costs escalating over time

Phasing Alternative D (segment) - (VA 2.1)

Capital Construction Cost:	\$34 Mil
Capital Right of Way Cost:	\$130,000

Big Easy

PM-R6.0/R11.2

Project length 5.2 miles

Features on I-5 include:

- Median widening the “biggest easy” segment possible beginning about one-quarter mile north of the North Street Undercrossing to the north limits of the project
- Same construction as Alternative B, only with shorter limits
- All transition to the 4-lane freeway segment occurs between the Tormey Drain Bridge (north of the North Street interchange) and the ramps on the south side of the Riverside Avenue interchange

Discussion:

- This segment is all median widening with no bridges or waterways to deal with – as easy and cost effective as it gets to plan, deliver, and construct

Features on local roads include:

- No work planned on local roadways

Advantages:

- Biggest bang for the buck – 5.2 lane miles each direction for about \$34 million in capital construction (2011 value – no escalation)
- Can be delivered fairly quickly

Disadvantages:

- Does not provide the same operational improvements and reduced congestion that closing the entire gap between 6-lane segments would provide
- Requires a separate project or projects down the road to finish closing the gap which will disrupt traffic again, and cost more due to costs escalating over time

Phasing Alternative E (segment) – (VA 1.3)

Capital Construction Cost:	\$46 Mil
Capital Right of Way Cost:	\$400,000

Big Easy plus Aux Lane

PM-R4.35/R5.15 & PM-R6.0/R11.2

Project length 6.0 miles

Features on I-5 include:

- This combines Phasing Alternative C, “Aux Lane”; and Phasing Alternative D, “Big Easy” into one project

Discussion:

- This addresses the weave between Deschutes Road and Balls Ferry Road plus adds the over 5 miles over easy work

Phasing Alternative F (segment) – (VA 2.2)

Capital Construction Cost:	\$18 Mil
Capital Right of Way Cost:	\$130,000

Little Easy

PM-R8.2/R11.2

Project length 3.0 miles

Features on I-5 include:

- Begins where median widens to 84 feet – a shorter version of the Big Easy project
- Construction is the same as all the alternatives for this segment -
- Cable barrier on an unpaved depressed section

Discussion:

- Median widening only where the existing median is 84 feet
- South end of the widening ends before the existing median transitions to 60 feet

Advantages:

- Same as Big Easy but a shorter less expensive project
- Can be delivered very quickly

Disadvantages:

- Does not provide the same operational improvements and reduced congestion that closing the entire gap between 6-lane segments would provide
- Requires a separate project or projects down the road to finish closing the gap which will disrupt traffic again, and cost more due to costs escalating over time

Phasing Alternative G(segment) – (VA 2.4A)

Capital Construction Cost:	\$39 Mil
Capital Right of Way Cost:	\$130,000

Anderson First – Inside Widening

PM-R4.3/R7.5

Project length 3.2 miles

Features on I-5 include:

- Same construction as Alternative B, only for shorter limits

Features on local roads include:

- Same construction as Alternative B for these limits

Discussion:

- This extends the 6-lane segment from Cottonwood Hills to north of the Sacramento River Bridge – making 6.2 miles of 6-lane freeway through Anderson
- Widens all the bridges in the project plus takes advantage of the median work at the recent Sacramento River bridge replacement

Advantages:

- Cost effective to widen all the bridges at once
- Existing “friction” from many closely spaced interchanges is minimized by adding a third lane

- Total of 6.2 miles of 6-lane will operate well (combining with “Cottonwood Hills” 6-lane segment)

Disadvantages:

- Does not close the gap between 6-lane segments
- Requires a separate project or projects down the road to finish closing the gap which will disrupt traffic again, and cost more due to costs escalating over time

Phasing Alternative H(segment) – (VA 2.4B)

Capital Construction Cost:	\$48 Mil
Capital Right of Way Cost:	\$400,000

Anderson First – Maintain Wide Median

PM-R4.3/R7.5

Project length 3.2 miles

Features on I-5 include:

- Same construction as Alternative A, only for shorter limits

Features on local roads include:

- Same construction as Alternative A for these limits

Discussion:

- This extends the 6-lane segment from Cottonwood Hills to north of the Sacramento River Bridge – making 6.2 miles of 6-lane freeway through Anderson
- Widens all the bridges in the project plus takes advantage of the median work at the recent Sacramento River bridge replacement

Advantages:

- Cost effective to widen all the bridges at once
- 6.2 miles of 6-lane will operate well

Disadvantages:

- Does not close the gap between 6-lane segments
- Bridges are the most expensive portion of the gaps project and this segment has all the bridges
- Requires a separate project or projects down the road to finish closing the gap which will disrupt traffic again, and cost more due to costs escalating over time

Value Analysis Alternatives

Value Analysis Study

A multi-functional Value Analysis (VA) team completed their study of this project in December 2011. The VA findings have already been incorporated in the list of alternatives.

VA recommendations include:

- Best Value – Alternative B – Preferred Alternative (VA 1.1)
- Best Performance – Alternative A (VA 1.2)
- Best Value of phased construction alternatives - Phasing Alternative C (VA 2.3, see follow up work in Section 7)
- Design considerations – Project savings can be realized if these alternatives are used -
 - Cable barrier instead of concrete barrier – (Alternative B-3)
 - Don't deck the median at bridges – (Alternative B-2)

7. FOLLOW UP WORK DURING THE PA&ED PHASE

There are issues that this PSR-PDS could not answer that will need to be followed up during the PA&ED phase. Time and resources will need to be set aside for these efforts. They include:

Structures:

- Structures Advance Planning Studies are needed for each bridge to be widened

Traffic Operations:

- A Highway Capacity Manual (HCM) weave analysis will need to be performed to evaluate Alternative C (Aux. lanes between Deschutes and Balls Ferry interchanges)
- An HCM analysis for the various mainline I-5 options will be needed (LOS, density)
- Ramp merge/diverge analysis
- The Ramp Metering District Directive DP-09, dated April 18, 2008 will need to be evaluated against each alternative
- Note: above traffic studies will require traffic volume data provided by others (System Planning and/or Shasta County)

- Actual field counts should be combined with Shasta County Regional Travel Demand Model output Origin & Destination data and analyzed for future conditions to determine the effectiveness of an aux lane vs. a third through lane in the corridor

Other studies:

- Corings are needed on North Street and Balls Ferry Road to determine exactly what is needed to lower the profile 6 - 9 inches to obtain clearance of 15 feet
- Noise studies will be needed to determine impacts and potential noise abatement strategies

Right of Way

- Presuming Alternative B, the preferred alternative, widen to the median is constructed
- Caltrans will work with local officials to preserve and protect the additional future right of way needed for the post 20-year facility, an 8-lane freeway (required where existing median is less than 84 feet)

8. TRANSPORTATION MANAGEMENT

A PSR-PDS level Transportation Management Plan (TMP) Data Sheet (Attachment H) was prepared in June 2011, before the VA Study Group developed the 11 alternatives presented in this PSR-PDS. The TMP Data Sheet described traffic impacts associated with construction of the 2 basic strategies: widen toward the median and widen toward the outside. In summary, the TMP Data Sheet concluded that widening to the outside could cause more significant impacts due to the potential for extended ramp closures and detours. It also recommended that during construction, two lanes be maintained for each direction of travel (a minimum of 29 feet horizontal clearance be provided to avoid truck restrictions). Staging to meet these requirements will be necessary for some alternatives.

Costs associated with the traffic impact mitigation measures identified in the TMP Data Sheet have been included in the alternative estimates. An updated TMP for the selected alternative is required and should be requested when the design is complete enough to determine specific traffic impacts, but early enough to make design changes required for traffic mitigation.

See Attachment H for more info.

9. RIGHT OF WAY

New right of way will be required for outside widening options (Alternative A and phased Alternatives C and H). Some utilities will be impacted; the railroad will be involved because

of the bridge being widened. A PSR-PDS level Right of Way Data Sheet has been prepared for this project for Alternative A and B.

See Attachment I for more info.

10. NON-STANDARD DESIGN FEATURES

This project has been reviewed by Jim Deluca, Caltrans Project Development Coordinator, on November 10, 2011. He concurs with the scope and range of alternatives presented.

The intent is to construct this project with a minimum of design exceptions, both mandatory and advisory. Full documentation for design exceptions will be included during the PA&ED phase.

Design exceptions identified to date include:

- Interchange spacing (Topic 501.3) – mandatory for all alternatives
- Left shoulder slope (Topic 302.2) – mandatory for Alternative A
- Do not deck the median – advisory for Alternative B-2
- Use cable barrier in 36 foot median – guidance calls for concrete barrier – advisory for Alternative B-3

The proposed design listed above exceptions were discussed with Mr. Deluca on December 15, 2011. He does not see any fatal flaws in the proposed mandatory design exceptions.

11. LOCAL AGENCY INVOLVEMENT

Jeff Kiser, Assistant City Manager for the City of Anderson, helped to develop the scope of this project. The vast majority of the proposed work is on mainline I-5. Proposed work within the community of Anderson will incorporate context sensitive solutions as appropriate.

The project development team will consider input from the public during the PA&ED phase for any aesthetic treatment for sound walls and retaining walls.

12. ENVIRONMENTAL DETERMINATION/DOCUMENT

A Preliminary Environmental Assessment Report (PEAR) has been prepared for this project and will be attached to this document. Please see Attachment J for more info.

Anticipated Environmental Document:

CEQA: Initial Study / Negative Declaration
NEPA: Categorical Exclusion

Special Considerations:

Environmental Document: It is recommended that an *Initial Study* is prepared to satisfy the requirements of CEQA. This project would connect two six-lane segments and would create a full 6-lane freeway from the City of Redding to the City of Anderson. The initial study should consider all of the sections contained in the CEQA initial study checklist. Technical studies may be required for *Air Quality, Hazards and Hazardous Materials, Hydrology/Water Quality, and Noise*.

Noise Impacts:

- A noise study will be required for all properties within 500 feet of the traveled way
- Noise levels above 66 decibels (dB) for residences, schools, and parks – must consider noise abatement
- Noise levels above 72 dB for commercial areas - must consider noise abatement
- Open graded asphalt is very cost effective at noise abatement – though FHWA does not currently consider it an abatement solution
- Cost effective noise walls will be considered if sound can be reduced by 5 dB or more
- Final decision on noise impacts will be determined during the PA&ED phase

Initial Site Assessment:

A Hazardous Waste Assessment has been conducted for this project. See Attachment K for more info.

Storm Water Data Report:

A Project Initiation Document (PID) level Long Form – Storm Water Data Report has been prepared for this project (see Attachment L).

- Risk Level: 2
- Total Disturbed Soil Area: 38 Acres (Alternative B)

13. FUNDING

The Shasta County RTPA Board has committed all of their new Regional Transportation Improvement Program (RTIP) funds to the I-5 corridor provided state or federal grants can provide matching funds.

Project Development:


- Local funds have been committed by the Shasta County RTPA to fund Project Approval and Environmental Document (PA&ED) for the entire 7-mile gap closure
- PA&ED to start as soon as a Cooperative Agreement is executed
- Shasta County RTPA proposes to use Regional Transportation Improvement Plan (RTIP) funds to pay for Plans, Specification, and Estimate (PS&E), Right of Way support, and Right of Way capital components for the entire 7-mile project with the first two years of the 2012 State Transportation Improvement Program (STIP)
- Intent of the Shasta County RTPA is to get this project “shovel ready” as soon as possible to capture any and all construction funds that may become available

Construction:

- Capital construction funding is proposed to come from future STIP cycles or other special funding opportunities that may arise
- Intent is to maximize the options to capture any other funds that may become available
- Full PS&E through Ready to List (RTL) for the entire limits will be developed – project can be broken into at least six different phased or shorter segments, as needed, to match construction funds available

13A. CAPITAL COST

Table 6: Capital and Support Costs

NOTE		CAPITAL & SUPPORT COSTS BY PROGRAM AND PROJECT FUNDING COMPONENT (Redding to Anderson 6 Lane)						
Please provide input to all yellow cells								
Program	Component	"Baseline" (Original Identified Hours and Funding)						
EA 02-4C402 EFIS 0200020191		Planned (Hours)	Loaded Rate Estimate (\$/Hr.)	Program Funding by Component (x1000)			Support/ Capital (%)	
				Prior Allocation	Initial Allocation Expectation			Total Component Funding
					Direct Charges	Indirect Charges		
Local Funds	PA&ED	3,953	\$86.00	\$0	\$229	\$111	\$340	0.52%
075.600	PS&E	39,166	\$96.00	\$0	\$2,537	\$1,223	\$3,760	5.78%
075.600	R/W	301	\$83.00	\$0	\$17	\$8	\$25	0.04%
TBD	CON	70,329	\$91.00	\$0	\$4,319	\$2,081	\$6,400	9.84%
SUPPORT SUBTOTAL		113,749		\$0	\$7,102	\$3,423	\$10,525	16.19%
		Baseline	Escalation	Total	PPM Deputy Directors Initials 			
075.600	R/W Capital	\$25	\$0.0	\$25				
TBD	Construction	\$60,000	\$5,000	\$65,000				
075.600	Support	\$10,525	\$0	\$10,525				
CAPITAL SUBTOTAL		\$60,025	\$5,000	\$65,025				
TOTALS				\$75,550				
Rate Information		Input		Historic Program Support/Capital Cost Data (%)				
Capital Contingency Rate %		20%		RANGE	Lowest Similar Project		27%	
ICRP Rate %		32.52%			Highest Similar Project		27%	
Escalation Rate Construction		2.083%			Average Similar Project		27%	
Escalation Rate R/W		0.00%		Cumulative 2010 STIP Support/Capital				
# of years to escalate		4	41.3%					

Note(s):

(1) Data based on a limited number of projects (1)

The following table includes the proposed funding spending by funding type.

Table 7: Fiscal Year and Funding Type			
Milestone	Fiscal Year	Type of Funds	Amount
Project Approval & Environmental Document	11/12	Local Funds	\$340,000
Plans, Specifications and Estimates	12/13	RTIP	\$3,760,000
Right of Way Support	13/14	RTIP	\$25,000
Right of Way Capital	13/14	RTIP	\$130,000 (escalated to 2015)
Construction Support	TBD	TBD	\$6,400,000
Construction Capital	TBD	TBD	\$65,000,000 (escalated to 2016)

14. SCHEDULE

HQ Milestones	Delivery Date (Month, Day, Year)
Begin Environmental	December 19, 2011
Notice of Intent (NOI)	-
Circulate DED	-
PA & ED	December 1, 2012
Regular Right of Way	January 2, 2013
Project PS&E	April 1, 2014
Right of Way Certification	March 1, 2014
Ready to List	August 1, 2014
Approve Contract	March 1, 2015
Contract Acceptance	January 2, 2017
End Project	January 2, 2018

15. FEDERAL HIGHWAY ADMINISTRATION (FHWA) COORDINATION

This report has been reviewed by Cesar Perez, FHWA Liaison Engineer, on November 7, 2011. He concurs with the following: Per (SAFETEA-LU 6004 23 U.S.C. 326), this project is eligible for federal-aid funding and is considered to be *STATE-AUTHORIZED* under current FHWA-Caltrans Stewardship Agreements.

16. DISTRICT CONTACTS

Questions or comments regarding the Project Study Report may be directed to:

Dale Widner, P.E.
(530) 225-3546
Project Engineer, Office of Advance Planning
Caltrans District 2
Email: dale.widner@dot.ca.gov

Mark Miller, P.E.
(530) 225-3094
Chief, Office of Advance Planning
Caltrans District 2
Email: mark.miller@dot.ca.gov

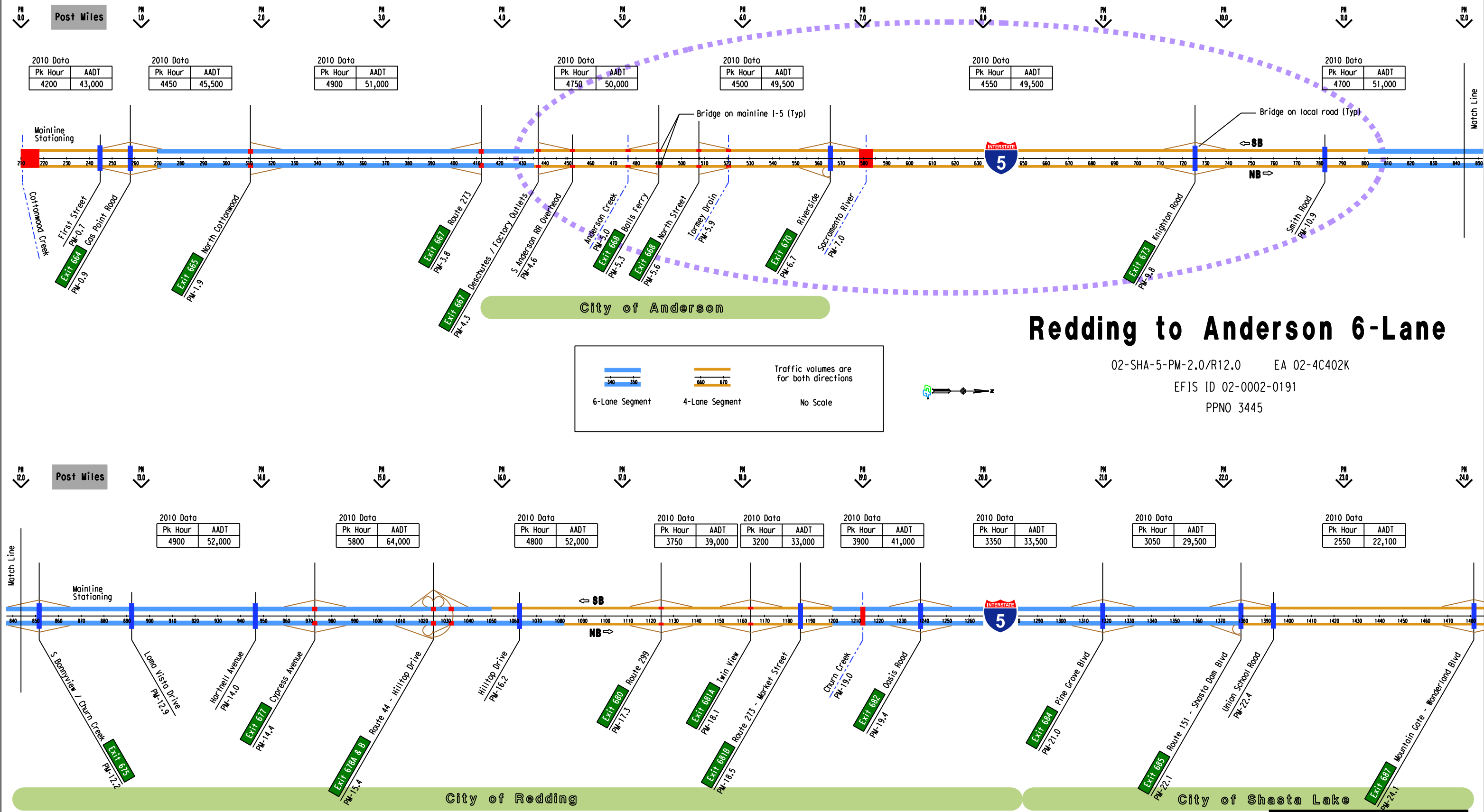
Phil Baker, P.E.
(530) 225-3180
Project Manager
Caltrans District 2
Email: phil.baker@dot.ca.gov

17. ATTACHMENTS

- A. Location Map
- B. Traffic Volumes
- C. Division of Structures, Advance Planning Study
- D. Alternatives Summary
- E. Alternatives – Simple
- F. Typical Sections

- G. Cost Estimates
- H. Traffic Management Plan Data Sheet
- I. Right of Way Data Sheet
- J. Preliminary Environmental Assessment Report
- K. Initial Site Assessment
- L. Storm Water Data Report






Memorandum

*Flex your power!
Be energy efficient!*

To: **DALE WIDNER**
Advance Planning
District 2

Date: October 11, 2011

File: 02-SHA-5 PM 2.0/R12.0
02-4C402K
South County 6-Lane
Gap Closure

From:  **JOE DOWNING**
Bridge Design Branch 3
Office of Bridge Design North
Structure Design
Division of Engineering Services MS 9-4/8I

Subject: Advance Planning Study Transmittal

Attached is the Advance Planning Study for the above reference project as submitted to the Division of Engineering Services by your requested memo dated July 20, 2011.

Per District's request, only one structure pair is chosen to undergo study.

ALTERNATIVE 1:

The estimated construction costs, including 7% mobilization and 25% contingencies for the bridges are as follows:

The following cost estimate is for left and right bridges combined.

<u>Structure Name</u>	<u>Alternative</u>	<u>Estimated Cost</u>
Balls Ferry Road UC (06-0140L)	1	\$ 1,061,000
Balls Ferry Road UC (06-0140R)	1	\$ 1,060,000
Total:		\$ 2,121,000

ALTERNATIVE 2:

The estimated construction cost, including 7% mobilization and 25% contingencies for the bridges is as follows:

Attachment C
Division of Structures
Advance Planning Study

DALE WIDNER – District 10
October 11, 2011
Page 2

<u>Structure Name</u>	<u>Alternative</u>	<u>Estimated Cost</u>
Balls Ferry Road UC (06-0140L/R)	2	\$ 2,258,000

ALTERNATIVE 3:

The estimated construction costs, including 7% mobilization and 25% contingencies for the bridges are as follows:

The following cost estimate is for left and right bridges combined.

<u>Structure Name</u>	<u>Alternative</u>	<u>Estimated Cost</u>
Balls Ferry Road UC (06-0140L)	3	\$ 2,509,000
Balls Ferry Road UC (06-0140R)	3	\$ 2,507,000
Total:		\$ 5,016,000

This Advance Planning Study and associated cost estimate is based on the following assumptions:

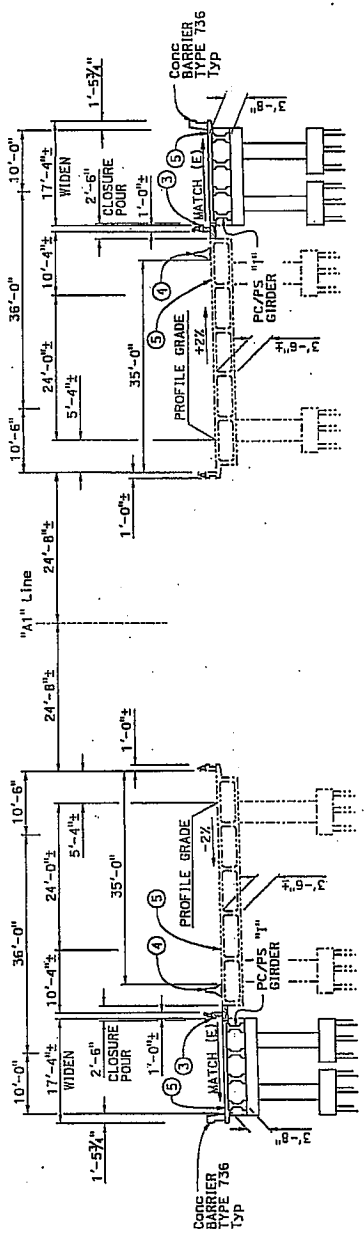
1. No soil report is available.
2. Assume normal construction windows.
3. Assume no environmental constraints.
4. All bridge foundations will be supported on Class 90 and Class 140 piles.
5. No seismic retrofit of existing structures is required based on the current seismic data provided.

If you have any questions regarding to this study, please contact Sharon Yen at (916) 227-5209 or Joe Downing at (916) 227-8430.

Attachment

c: TOstrom
JDowning
MAmini
Project File

DIST	COUNTY	ROUTE	POST MILE
02	SHA	5	X



LEFT BRIDGE
TYPICAL SECTION
1" = 20'

RIGHT BRIDGE
TYPICAL SECTION
1" = 20'

- LEGEND:
- Indicates New Structure
 - - - - - Indicates Existing Structure
 - /// Indicates Bridge removal (portion)

- NOTES:
- 1 Paint, "BRIDGE NO. 06-0140 LVR"
 - 2 Paint, "BALLS FERRY ROAD UNDERCROSSING"
 - 3 Existing overhang & barrier (Type 1) to be removed
 - 4 Temp railing (Type k)
 - 5 3/4" Polyester Concrete Overlay
 - 6 Replace existing joint seal (Type B)
 - 7 Structure Approach Type N(305)
 - 8 Slope Paving

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
DATE: 07-SEP-2011
Office of Structures Design
STATE OF CALIFORNIA

Sheet 2 of 2

ALTERNATIVE NO. 1
PLANNING STUDY
BALLS FERRY UC (WIDEN)
UNIT: 357B
BRIDGE No. 06-0140 R/L
SCALE: AS NOTED
PROJECT No. & PHASE: 00020191K
CONTRACT No.: 02-4C020

STRUCTURE DESIGN BRANCH	3
DESIGNED BY: Gharan Yen	DATE: 9/7/11
DRAWN BY: Joy Reid	DATE: 9/7/11
CHECKED BY: X	DATE: X
APPROVED: X	DATE: X

FILE: 03 06-0140-00a-dt1.dgn

DIST	COUNTY	ROUTE	POST MILE
02	SHA	5	5.29

LEGEND:

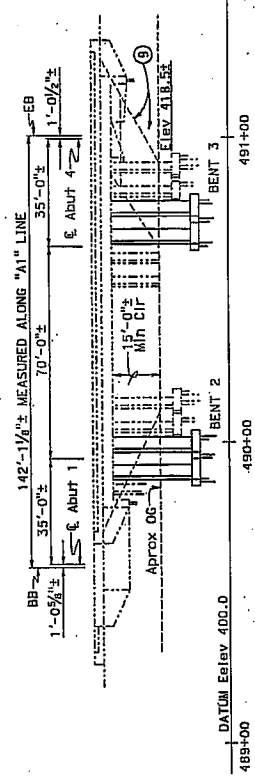
- Indicates New Structure
- Indicates Existing Structure
- Indicates Bridge removal (portion)

NOTES:

- Point, "BRIDGE NO. 05-0140 L.V.R"
- Point, "BALLS FERRY ROAD UNDERCROSSING"
- Existing overhang & barrier (Type 1) to be removed
- Temp railing (Type k)
- 3/4" Polyester Concrete Overlay
- Replace existing joint seal (Type B)
- Joint Seal (Type AL)
- Approach Slab Type N(305)
- Slope Paving

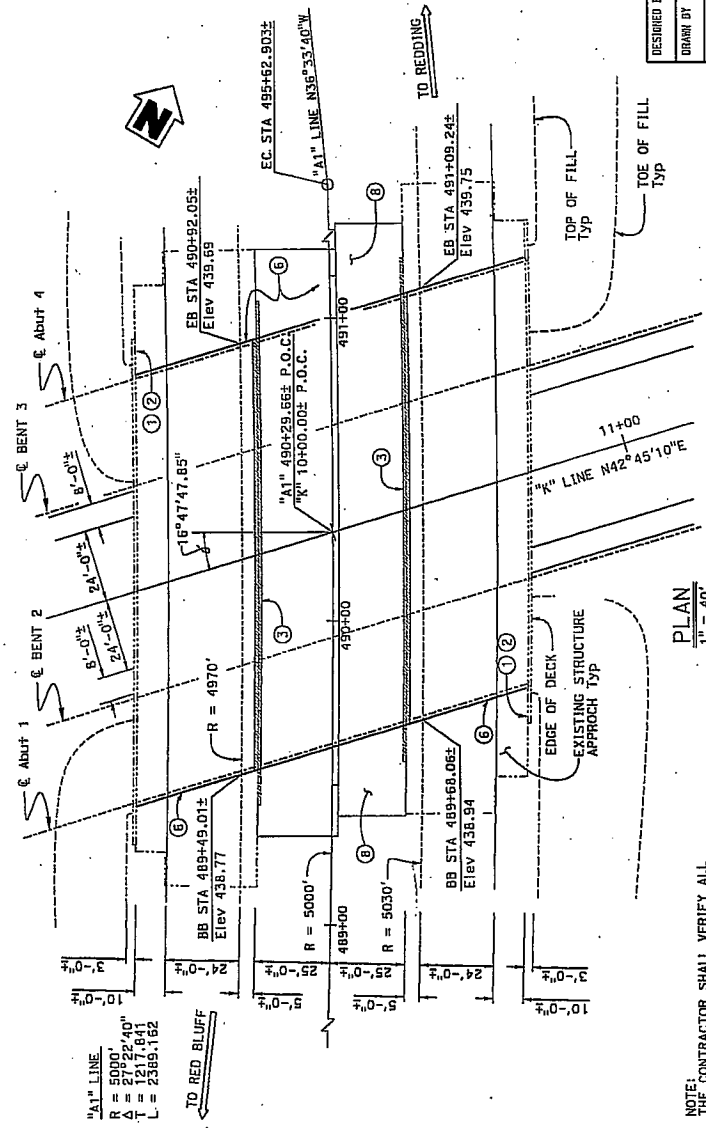
GENERAL NOTES:

- Local road will need to be lowered to meet 15'-0" min. vertical clearance.
- Traffic will pass under structure during construction. Temporary lane reduction needed for foundation work. Temporary road closure needed for girder erection.
- Traffic will be carried on existing structure..
- No falsework allowed over traffic except decking.
- Utilities to be relocated.
- Water flow across bridge deck is to be checked.



ELEVATION

1" = 40'



NOTE: CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED DATE: 107-SEP-2011 OFFICE OF SHERRA BAKER STATE OF CALIFORNIA

ALTERNATIVE NO. 2

PLANNING STUDY

STRUCTURE DESIGN BRANCH

BALLS FERRY UC (WIDEN)

UNIT: 3578 BRIDGE No. 05-0140 R/L

SCALE: AS NOTED PROJECT No. & PHASE: 00020191K

STRUCTURE DESIGN BRANCH

3

DATE: 9/7/11

DATE: 9/7/11

DATE: X

DATE: X

DATE: X

DATE: X

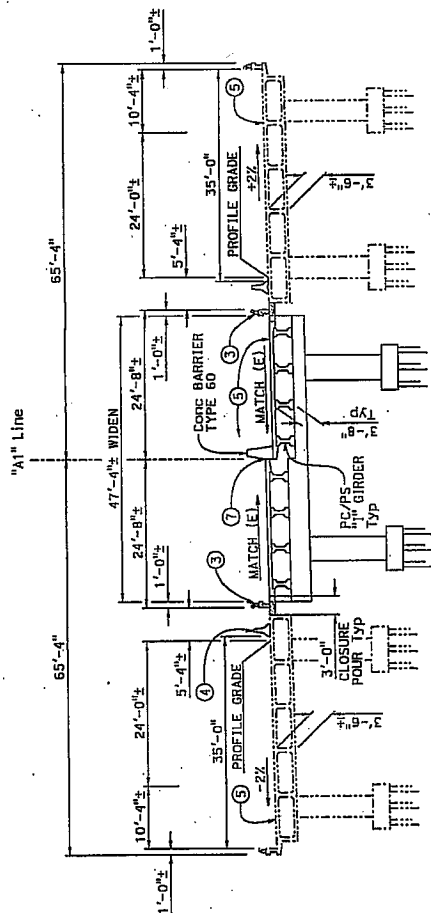
DATE: X

DATE: X

FILE # 05-0140-05-0140-012.dgn

STRUCTURE DESIGN ADVANCE PLANNING STUDY SHEET (ELEVATION) (REV. 05-05-10)

DIST	COUNTY	ROUTE	POST MILE
02	SHA	5	5.29



TYPICAL SECTION
1" = 20'

LEGEND:

- Indicates New Structure
- Indicates Existing Structure
- Indicates Bridge removal (portion)

NOTES:

1. Paint, "BRIDGE NO. 06-0140 LVR"
2. Paint, "BALLS FERRY ROAD UNDERCROSSING"
3. Existing overhang & barrier (Type 1) to be removed
4. Temp railing (Type K)
5. 3/4" Polyester Concrete Overlay
6. Replace existing joint seal (Type B)
7. Joint Seal (Type AL)
8. Approach Slab Type N(30S)
9. Slope Paving

INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
DATE: 01-SEP-2011
Office of Structures Group
STATE OF CALIFORNIA

SHEET 2 OF 2

ALTERNATIVE NO. 2
PLANNING STUDY

DESIGNED BY	DATE	9/7/11
DRAWN BY	Jay Reid	DATE 9/7/11
CHECKED BY	X	DATE X
APPROVED	X	DATE X

STRUCTURE
DESIGN
BRANCH
3

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

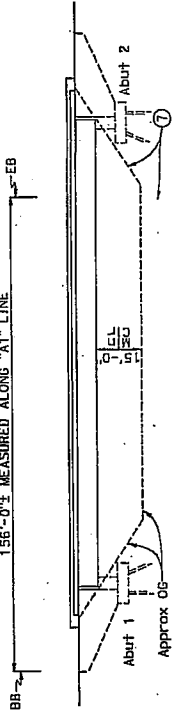
BALLS FERRY UC (WIDEN)
UNIT: 3578
BRIDGE NO. 06-0140 R/L
PROJECT NO. & PHASE: 00020191K
SCALE: AS NOTED

CONTRACT NO.: 02-HK020

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (UNLISHED) (REV. 08-08-10)

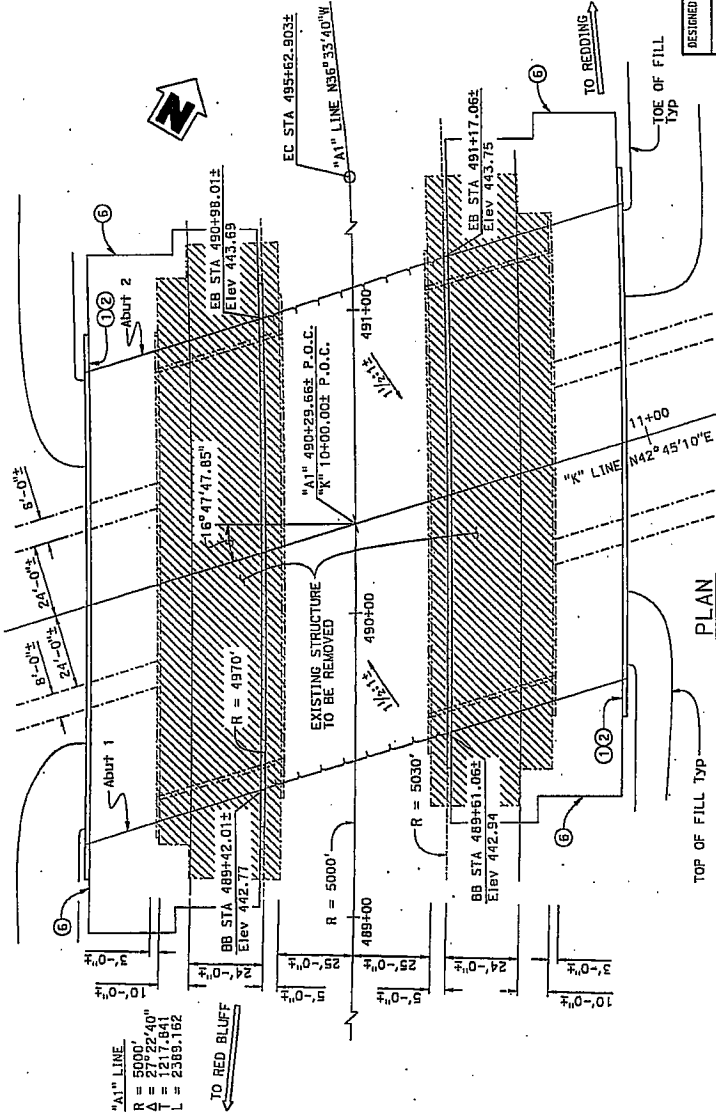
DIST	COUNTY	ROUTE	POST MILE
02	SHA	5	5.29

156'-0"± MEASURED ALONG "A1" LINE



DATUM Elev 400.0

489+00 490+00 491+00

ELEVATION
1" = 40'

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
DIMENSIONS AND FIELD DIMENSIONS
BEFORE CONSTRUCTION OR FABRICATING
ANY MATERIAL.

LEGEND:

- Indicates New Structure
- - - - - Indicates Existing Structure
- ZZZZZZ Indicates Stage Bridge Removal (portion)

NOTES:

- ① Point, "BRIDGE NO. 06-0140 L/R"
- ② Point, "BALLS FERRY ROAD UNDERCROSSING"
- ③ Temp Rail (Type K)
- ④ ¾" Polyester Concrete Overlay
- ⑤ Infill Wall @ Bents 2 & 3
- ⑥ Structure Approach Type N(30S)
- ⑦ Slope Paving
- ⑧ CIP P/S Concrete Box

GENERAL NOTES:

1. Local road requires 15'-0" min. vertical clearance.
2. Traffic will pass under structure during construction. Temporary road closure needed for demolition and jacking operation.
3. Traffic will be carried on exiting structure. Stage construction is required.
4. Structure will be built high approximate falsework depth of 3 ft. and lowered into place.
5. Utilities to be relocated.
6. Water flow across bridge deck is to be checked.

DATE OF ESTIMATE	10-7-11	TNC
BRIDGE REMOVAL	=	
STRUCTURE DEPTH	=	71
LENGTH	=	156
WIDTH	=	54
AREA	=	4,204
COST / C. INCLUDING	=	2,663
10% MOBILIZATION &	=	2,570,000
25% CONTINGENCY	=	2,570,000
TOTAL COST	=	2,570,000

SHEET 1 OF 2

ALTERNATIVE NO. 3

STRUCTURE
DESIGN
BRANCH
3

DESIGNED BY	Sharon Yen	DATE	9/7/11
DRAWN BY	Joy Reid	DATE	9/7/11
CHECKED BY	X	DATE	X
APPROVED	X	DATE	X

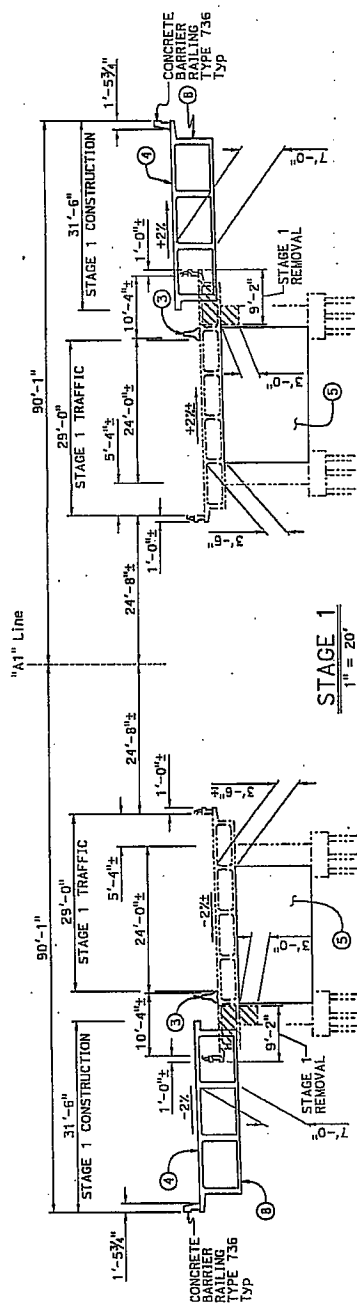
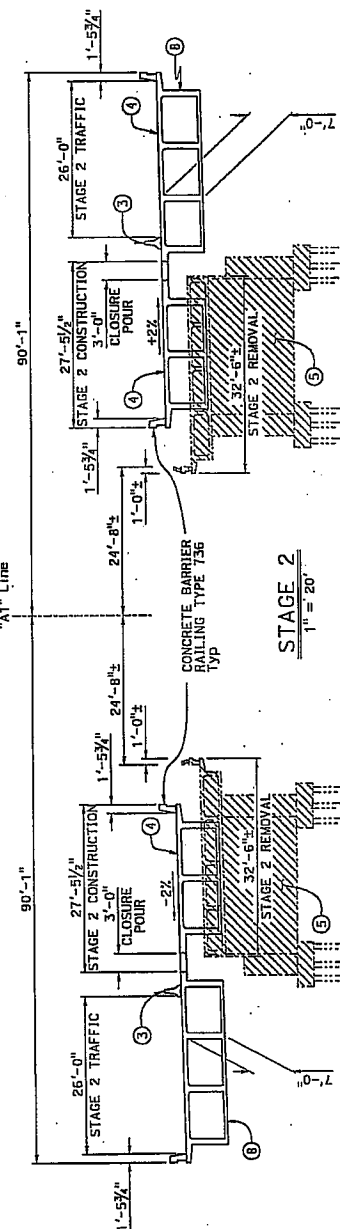
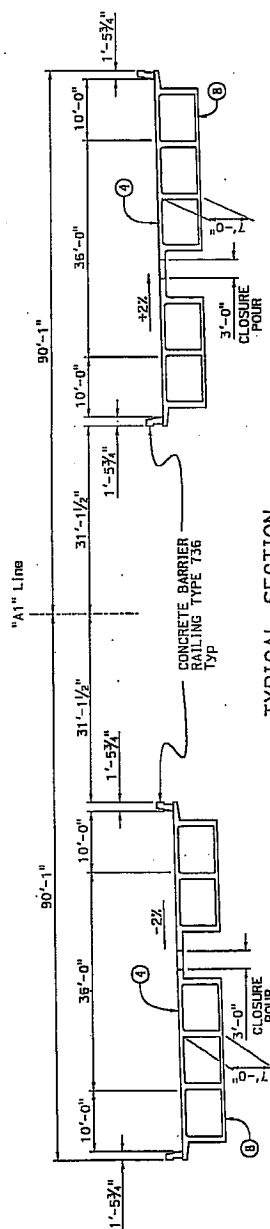
BALLS FERRY UC (REPLACE)

UNIT: 3578	BRIDGE NO. 06-0140	R/L
SCALE: AS NOTED	PROJECT NO. & PHASE: 00020191K	

CONTRACT NO. 102-14000

FILE # 06-0140-qps-013.0pm

DIST	COUNTY	ROUTE	POST MILE
02	SHA	5	5.29

STAGE 1
1" = 20'STAGE 2
1" = 20'TYPICAL SECTION
1" = 20'

LEGEND:

- Indicates New Structure
- - - - - Indicates Existing Structure
- ||||| Indicates Stage Bridge removal (portion)

NOTES:

- 1 Point, "BRIDGE NO. 06-0140 L/R"
- 2 Point, "BALLS FERRY ROAD UNDERCROSSING"
- 3 Temp Rail (Type K)
- 4 3/4" Polyester Concrete Overlay
- 5 Infill Wall @ Bents 2 & 3
- 6 Structure Approach Type N(305)
- 7 Slope Paving
- 8 CIP P/S Concrete Box

INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
DATE: 07-SEP-2011
Office of Structural Bridge
STATE OF CALIFORNIA

SHEET 2 OF 2

ALTERNATIVE NO. 3

PLANNING STUDY

BALLS FERRY UC (REPLACE)

UNIT: 3578 BRIDGE No. 06-0140 R/L

SCALE: AS NOTED PROJECT No. & PHASE: 00020191K

CONTRACT No. 06-K020

DESIGNED BY	Sharon Yen	DATE	9/7/11	STRUCTURE DESIGN BRANCH 3
DRAWN BY	Joy Reid	DATE	9/7/11	
CHECKED BY	X	DATE	X	
APPROVED	X	DATE	X	

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

STRUCTURES DESIGN ADVANCE PLANNING STUDY (REVISED) (REV. 04-03-10)

Alternatives and VA Summary

Value Analysis Name	VA 1.2	VA 1.1				VA 2.3	VA 2.1	VA 1.3	VA 2.2	VA 2.4A	VA 2.4B
Alternative Name	A	B	B - 1	B-2	B - 3	C	D	E	F	G	H
Construction	All at once					Segments - Partial Construction					
Name / Description	Maintain Wide Median	Inside Widening - Baseline	Inside Widening - Replace Deschutes UC	Inside Widening - Don't Deck Median	Inside Widening - Cable Barrier	Aux Lane	Big Easy	Big Easy + Aux Lane	Little Easy	Anderson First - Inside Widening	Anderson First - Maintain Wide Median
Post Mile Limits	4.1/11.2	4.3/11.2	4.3/11.2	4.3/11.2	4.3/11.2	4.35/5.15	6.0/11.2	4.35/5.15, 6.0/11.2	8.2/11.2	4.3/7.5	4.1/7.5
Project Length - Miles	7.1	6.9	6.9	6.9	6.9	0.8	5.2	6.0	3.0	3.2	3.4
Project Costs											
Roadway	\$60,000,000	\$47,000,000	\$55,000,000	\$47,000,000	\$41,000,000	\$9,000,000	\$34,000,000	\$40,000,000	\$18,000,000	\$26,000,000	\$36,000,000
Structures	\$12,000,000	\$13,000,000	\$16,000,000	\$11,000,000	\$13,000,000	\$6,000,000	\$0	\$6,000,000	\$0	\$13,000,000	\$12,000,000
Right of Way	\$578,000	\$130,000	\$130,000	\$130,000	\$130,000	\$400,000	\$130,000	\$400,000	\$130,000	\$130,000	\$400,000
Capital Total	\$72,578,000	\$60,130,000	\$71,130,000	\$58,130,000	\$54,130,000	\$15,400,000	\$34,130,000	\$46,400,000	\$18,130,000	\$39,130,000	\$48,400,000
All Support	\$13,762,000	\$10,525,000	\$10,525,000	\$10,525,000	\$10,525,000						
Total	\$86,340,000	\$70,655,000	\$81,655,000	\$68,655,000	\$64,655,000						
Features											
Baseline Project		X									
Closes the gap between 6-lane segments	X	X	X	X	X						
No design exceptions (except interchange spacing)	X	X	X		X	X	X	X	X	X	X
Outside only widening						X					
Outside and inside widening	X							X			X
Inside only widening		X	X	X	X		X		X	X	
36 ft paved median at Sacramento River - through Riverside interchange (1.2 miles)	X	X	X	X	X		X	X	X	X	X
36 and 60 ft Median		X	X	X	X		X	X		X	
Unpaved depressed median in 60 and 70 ft median	X					X			X		X
Unpaved depressed median	X				X	X	X	X	X		X
Paved tent section in 36 ft median		X	X	X			X	X		X	
Cable barrier in 36 ft median					X						
Cable barrier in 60 and 70 ft median	X	X	X	X	X	X	X	X	X		X
Concrete barrier in 36 ft median		X	X	X			X	X		X	
Modify exit ramp gores	X					X		X			X
Modify entrance ramp gores	X					X		X			X
Widen bridges as needed	X			X		X		X			X
Deck the median at bridges		X	X		X					X	
Replace Deschutes UC bridge			X								
More structural section for new outside lane	X					X					X
Less efficient worksite since work area is split up	X					X		X			X
Soundwalls	X					X		X			X
Retaining walls	X					X		X			X
Aux lane each direction between Deschutes and Balls Ferry interchanges						X		X			
Modify/add drainage facilities as needed	X	X	X	X	X	X	X	X	X	X	X
Modify ITS elements and other improvements as needed	X	X	X	X	X	X	X	X	X	X	X
Lower crown at Balls Ferry Road	X	X	X	X	X					X	X
Lower Crown at North Street	X	X	X	X	X					X	X
New right of way required	X					X		X			X
Little or no new right of way required		X	X	X	X		X		X	X	

Note: Features marked with an "x" are included in that alternative

Attachment D
Alternatives Summary

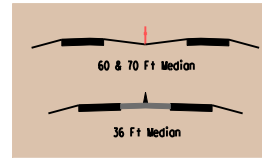
Redding to Anderson 6-Lane

Begin
PM 4.1

EA 02-4C402K

02-SHA-5-PM-2.0/R12.0

End
PM 11.2



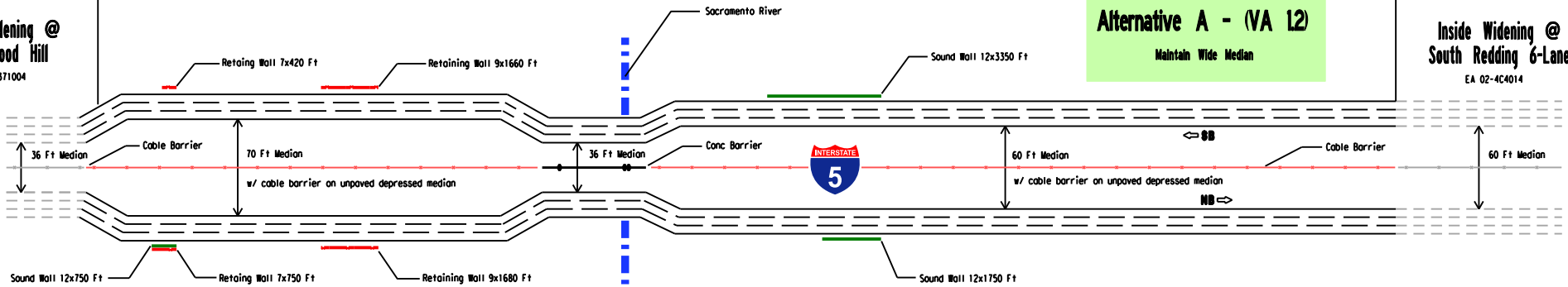
No Scale

Inside Widening @
Cottonwood Hill
EA 02-371004

Alternative A - (VA 12)
Maintain Wide Median

Inside Widening @
South Redding 6-Lane
EA 02-4C4014

Proposed
Median
Condition



Post Miles



Begin
PM 4.3



PM 8.25

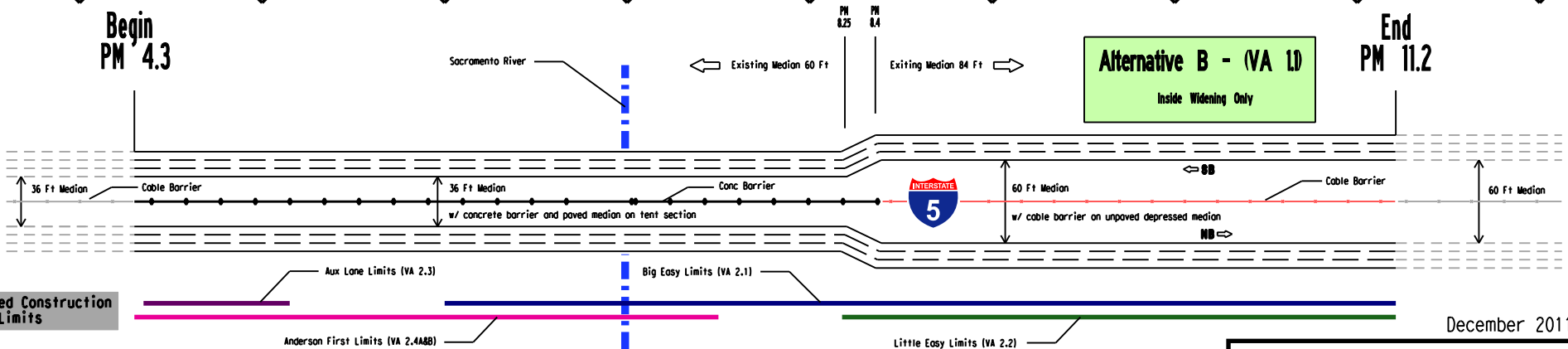
PM 8.4



End
PM 11.2



Proposed
Median
Condition



Phased Construction
Job Limits

Aux Lane Limits (VA 2.3)

Big Easy Limits (VA 2.1)

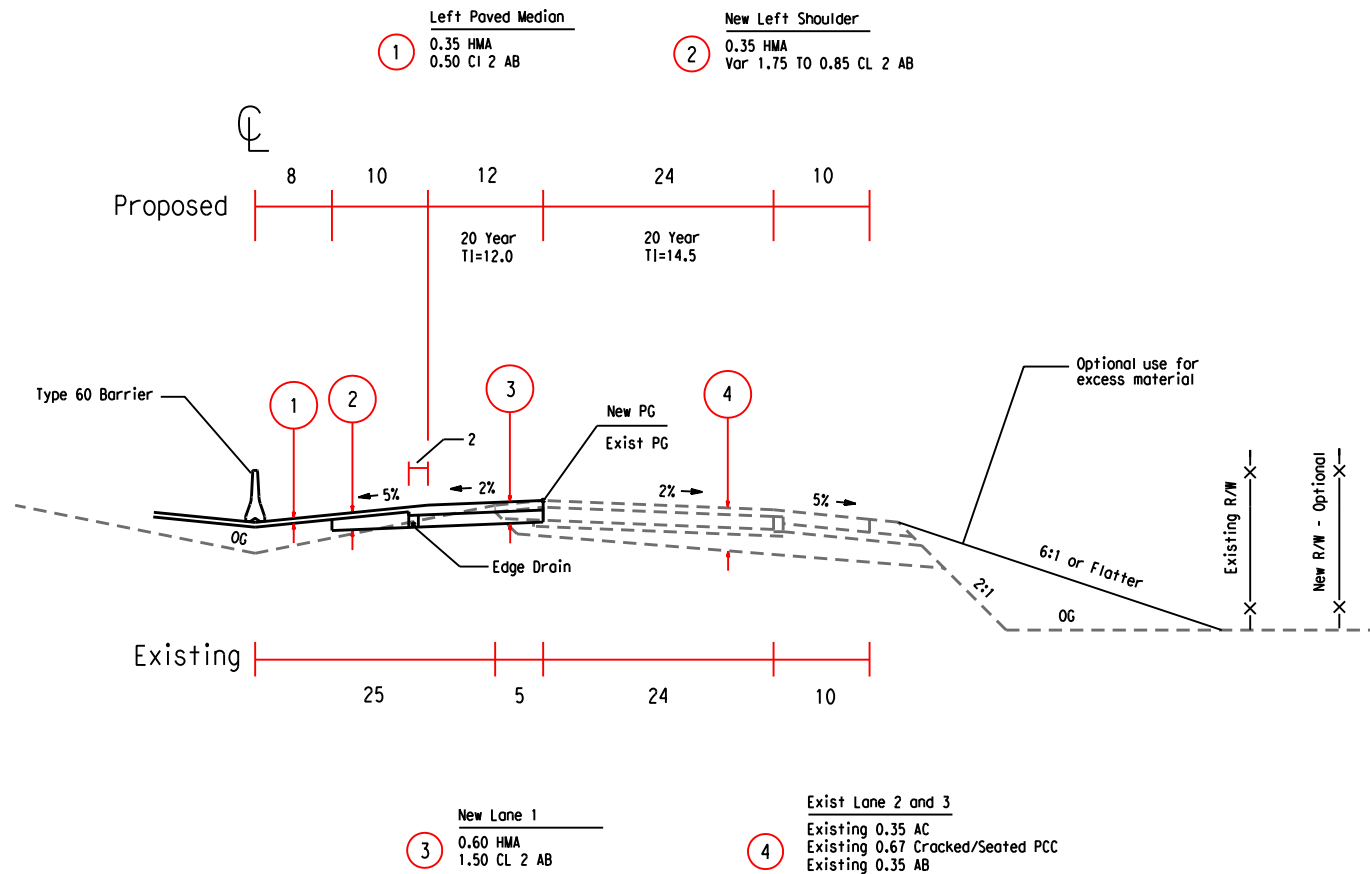
Anderson First Limits (VA 2.4ABB)

Little Easy Limits (VA 2.2)

December 2011

Attachment E
Alternatives - Simple

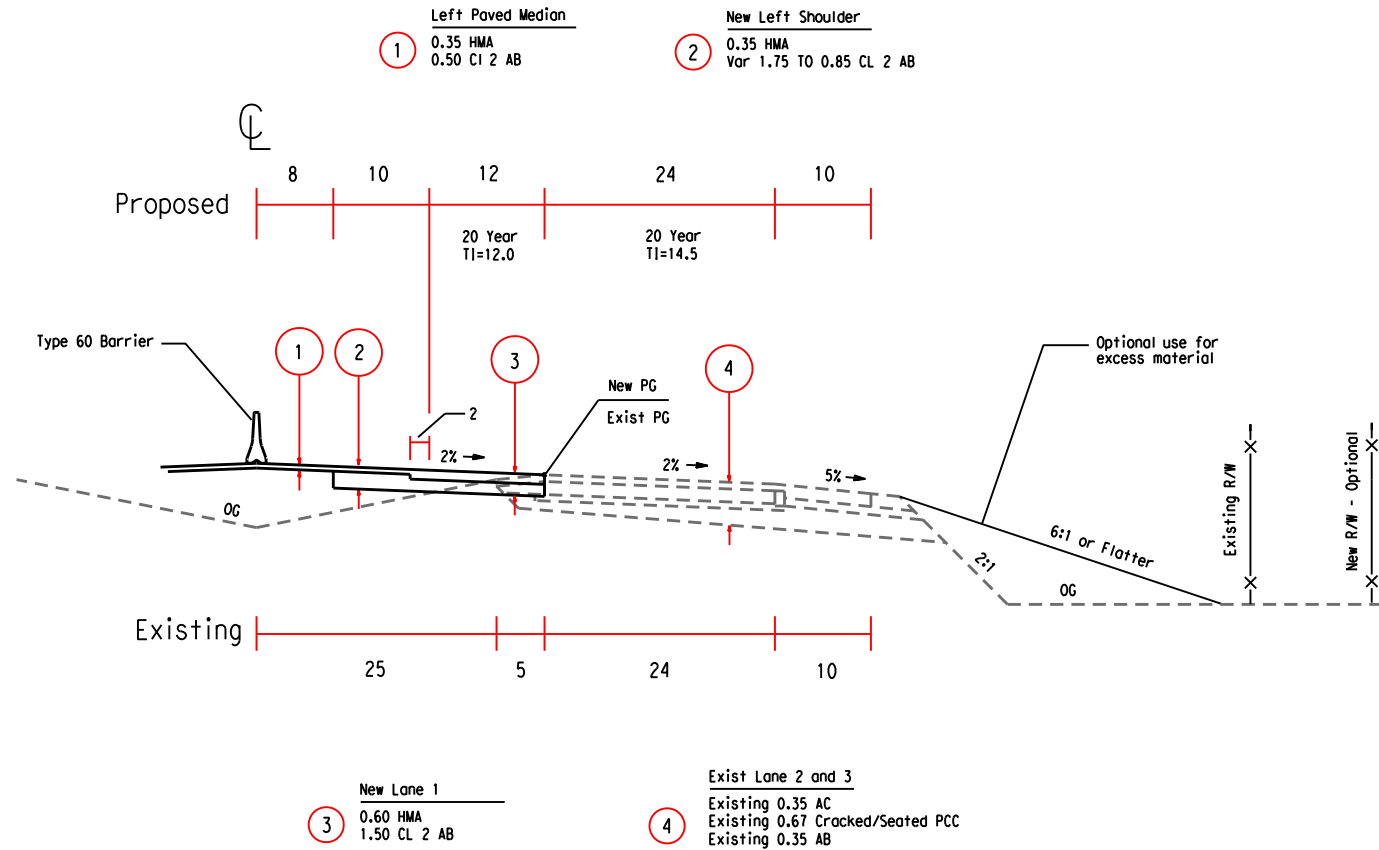
NB Lanes Shown - SB Lanes Similar



Inside Widening - Depressed Median Option SHA-5-PM-R4.3/R8.4

No Scale

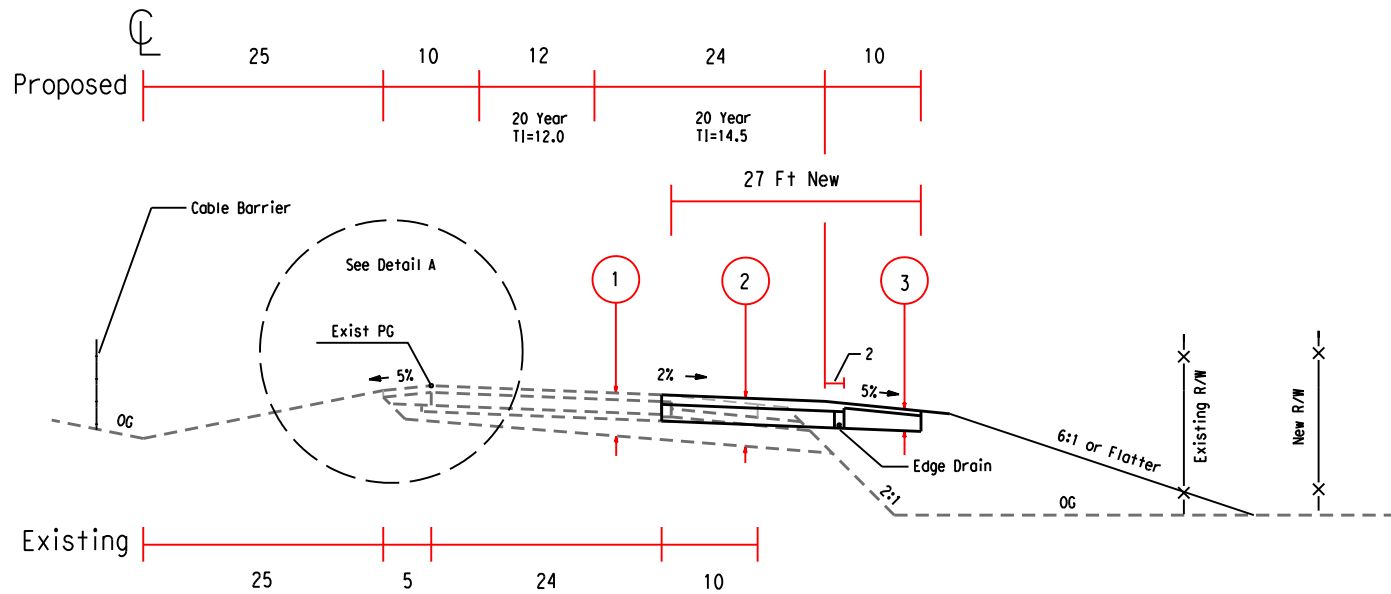
NB Lanes Shown - SB Lanes Similar



Inside Widening - Raised Median Option SHA-5-PM-R4.3/R8.4

No Scale

NB Lanes Shown - SB Lanes Similar



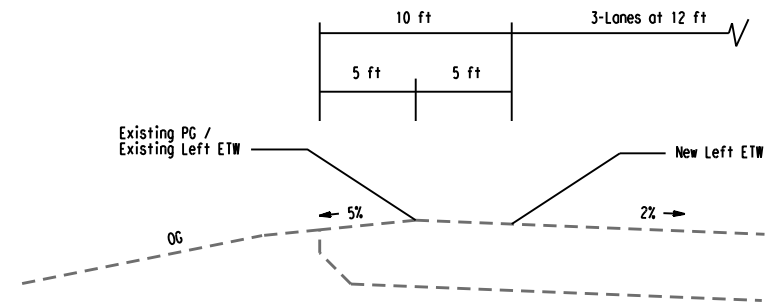
1 New Lane 1, Part Lane 2
Existing 0.35 AC
Existing 0.67 Cracked/Sealed PCC
Existing 0.35 AB

2 New Lane 2 and 3
0.75 HMA
1.80 CL 2 AB

3 New Right Shoulder
0.45 HMA
Var 2.1 to 1.05 CL 2 AB

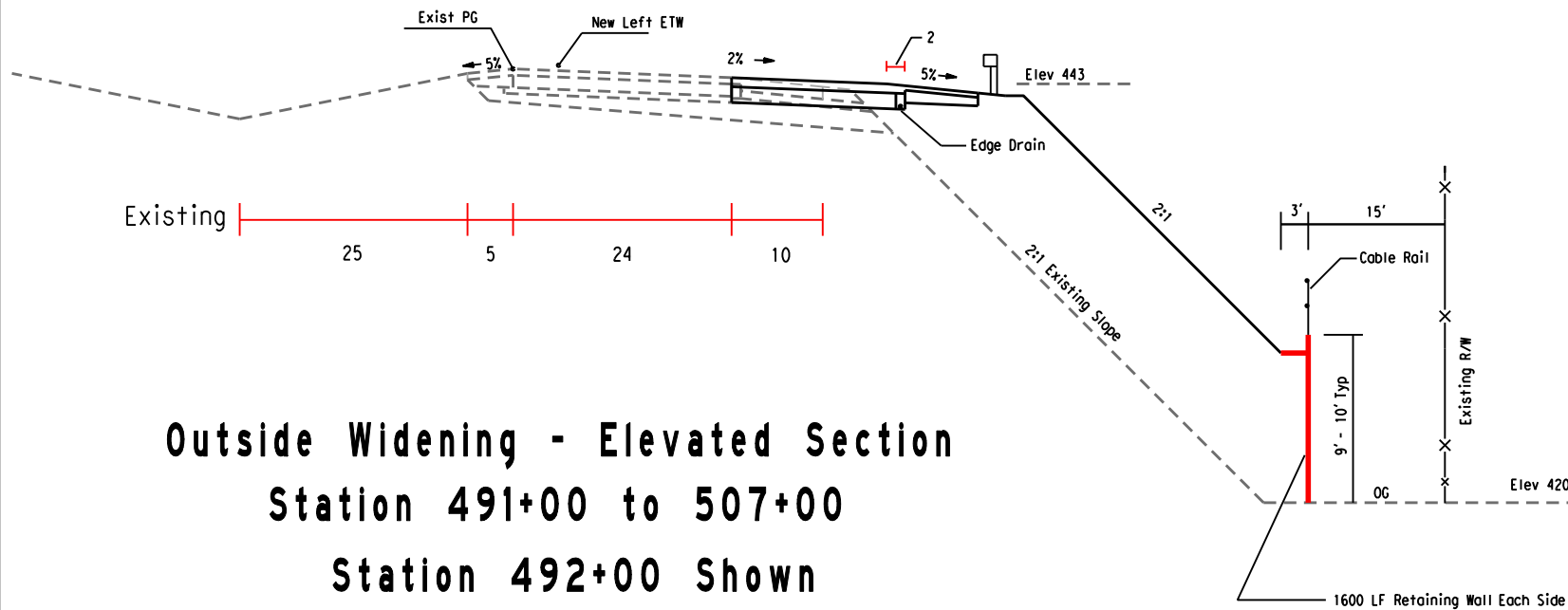
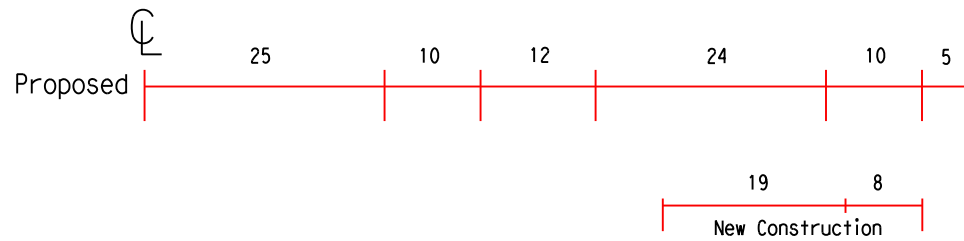
Outside Widening SHA-5-PM-R4.1/R8.4

No Scale



Detail A - Left Shoulder

NB Lanes Shown - SB Lanes Similar



No Scale

Alt A (VA 1.2) Maintain Wide Median

PM-R4.1/R11.2 (7.1 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		RETAINING WALLS	SQFT	40,000	\$75	\$3,000,000
7		Soundwalls 12 ft x 6300 ft	Mile	1.2	\$2,800,000	\$3,360,000
8		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS depressed unpaved median, cable barrier	LM	5.8	\$1,900,000	\$11,020,000
9		Increased cost for structural section added to the outside PM-4.1 to 8.3 add 15%	LM	8.1	\$2,185,000	\$17,698,500
10		MODIFY 3 ONRAMPS	LS	LUMP SUM	\$750,000	\$750,000
11		MODIFY 3 OFFRAMPS	LS	LUMP SUM	\$750,000	\$750,000
12		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$250,000	\$250,000
13		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
14	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
15		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$50,000	\$50,000
16		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$100,000	\$100,000
17		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$150,000	\$150,000
18		VERTICAL CLEARANCE IMPROVEMENT - DESCHUTES	LS	LUMP SUM	\$100,000	\$100,000
19		LANDSCAPING	LS	LUMP SUM	\$500,000	\$500,000
					Roadway Subtotal	\$39,770,000
		MOBILIZATION 10%				\$3,977,000
		SUPPLEMENTAL WORK 2%				\$795,400
		CONTINGENCIES 22%				\$9,799,328
20		Less effective production for outside widening portion - increase costs by 30%			\$5,309,550	\$5,310,000
					ROADWAY TOTAL	\$60,000,000
		Structures items include 7% mobilization and 25% contingency				
21		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	3,434	\$430	\$1,476,620
22		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	7,446	\$500	\$3,723,000
23		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB, widen by 17 ft each direction	SQFT	680	\$100	\$68,000
24		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,046	\$350	\$1,416,100
25		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,828	\$430	\$2,076,040
26		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,692	\$430	\$2,017,560
27		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 widen each bridge by 17 ft	SQFT	2,006	\$350	\$702,100
					BRIDGE TOTAL	\$12,000,000
		RIGHT OF WAY			\$578,000	\$578,000
					TOTAL (ROUNDED)	\$72,578,000

**Attachment G
Cost Estimates**

Alt B (VA 1.1)

Inside Widening - Baseline Project

PM-R4.3/R11.2 (6.9 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTC, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS concrete barrier on paved tent section median	LM	13.5	\$1,900,000	\$25,650,000
7		Concrete median barrier, on paved structural section INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	8.4	\$600,000	\$5,040,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$250,000	\$250,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
10	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$650,000	\$650,000
12		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$150,000	\$150,000
13		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$100,000	\$100,000
					Roadway Subtotal	\$33,900,000
		MOBILIZATION 10%				\$3,390,000
		SUPPLEMENTAL WORK 2%				\$678,000
		CONTINGENCIES 22%				\$8,352,960
					ROADWAY TOTAL	\$47,000,000
		Structures items include 7% mobilization and 25% contingency				
14		STRUCTURE 1&2 (DESHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	4,777	\$335	\$1,600,396
15		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	10,359	\$375	\$3,884,513
16		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 LG RCB NO IMPACT AT MEDIAN	SQFT	0	\$100	\$0
17		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	5,629	\$275	\$1,547,893
18		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,717	\$335	\$2,250,061
19		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,527	\$335	\$2,186,679
20		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 DECK MEDIAN	SQFT	2,791	\$275	\$767,443
					BRIDGE TOTAL	\$13,000,000
		RIGHT OF WAY			130,000	\$130,000
					TOTAL (ROUNDED)	\$60,130,000

Alt B - 1

Inside Widening - Replace Deschutes UC

PM-R4.3/R11.2 (6.9 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		ROADWAY REALIGNMENT APPROACH AND DEPART DESCHUTES	LM	2	\$4,800,000	\$9,600,000
7		Concrete median barrier, on paved structural section INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	8.4	\$600,000	\$5,040,000
8		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTC, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS Concrete barrier on paved tent section median	LM	11.5	\$1,900,000	\$21,850,000
9		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$250,000	\$250,000
10		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
11	860930	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
12		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$650,000	\$650,000
13		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$150,000	\$150,000
14		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$100,000	\$100,000
					Roadway Subtotal	\$39,700,000
		MOBILIZATION 10%				\$3,970,000
		SUPPLEMENTAL WORK 2%				\$794,000
		CONTINGENCIES 22%				\$9,782,080
					ROADWAY TOTAL	\$55,000,000
		Structures items include 7% mobilization and 25% contingency				
15		REPLACE STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29	SQFT	18400	\$275	\$5,060,000
16		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	10359	\$375	\$3,884,513
17		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 LG RCB NO IMPACT AT MEDIAN	SQFT	0	\$100	\$0
18		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	5629	\$275	\$1,547,893
19		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6717	\$335	\$2,250,061
20		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6527	\$335	\$2,186,679
21		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 DECK MEDIAN	SQFT	2791	\$275	\$767,443
					BRIDGE TOTAL	\$16,000,000
		RIGHT OF WAY			130,000	\$130,000
					TOTAL (ROUNDED)	\$71,130,000

Alt B -2

Inside Widening - Don't Deck the Median

PM-R4.3/R11.2 (6.9 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		ROADWAY ELEMENTS- 12' LANE 10' SHOULDER, HICB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS concrete median on paved tent section	LM	13.5	\$1,900,000	\$25,650,000
7		EXTRA ROADWAY MEDIAN WIDEN ENTIRE MEDIAN (36-FT) INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	8.4	\$600,000	\$5,040,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$250,000	\$250,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
10	860930	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$650,000	\$650,000
12		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$150,000	\$150,000
13		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$100,000	\$100,000
					Roadway Subtotal	\$33,900,000
		MOBILIZATION 10%				\$3,390,000
		SUPPLEMENTAL WORK 2%				\$678,000
		CONTINGENCIES 22%				\$8,352,960
					ROADWAY TOTAL	\$47,000,000
		Structures items include 7% mobilization and 25% contingency				
14		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	3,434	\$390	\$1,339,260
15		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	7,446	\$450	\$3,350,700
16		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 LG RCB NO IMPACT AT MEDIAN	SQFT	0	\$90	\$0
17		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	4,046	\$320	\$1,294,720
18		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	4,828	\$390	\$1,882,920
19		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	4,692	\$390	\$1,829,880
20		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 widen each bridge by 17 ft	SQFT	2,006	\$320	\$641,920
					BRIDGE TOTAL	\$11,000,000
		RIGHT OF WAY			\$130,000	\$130,000
					TOTAL (ROUNDED)	\$58,130,000

Alt B -3

Inside Widening - Cable Barrier

PM-R4.3/R11.2 (6.9 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HICB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS cable barrier on unpaved depressed section	LM	13.5	\$1,900,000	\$25,650,000
7		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$750,000	\$750,000
8		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
9	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
10		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$650,000	\$650,000
11		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$150,000	\$150,000
12		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$100,000	\$100,000
					Roadway Subtotal	\$29,400,000
		MOBILIZATION 10%				\$2,940,000
		SUPPLEMENTAL WORK 2%				\$588,000
		CONTINGENCIES 22%				\$7,244,160
					ROADWAY TOTAL	\$41,000,000
		Structures items include 7% mobilization and 25% contingency				
13		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	4,777	\$335	\$1,600,396
14		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	10,359	\$375	\$3,884,513
15		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 LG RCB NO IMPACT AT MEDIAN	SQFT	0	\$100	\$0
16		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	5,629	\$275	\$1,547,893
17		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,717	\$335	\$2,250,061
18		STRUCTURE 9&10 (NORTH STREET UC 06-0112L/R) PM R5.64 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,527	\$335	\$2,186,679
19		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 DECK MEDIAN	SQFT	2,791	\$275	\$767,443
					BRIDGE TOTAL	\$13,000,000
		RIGHT OF WAY			\$130,000	\$130,000
					TOTAL (ROUNDED)	\$54,130,000

Alt C (VA 2.3)**Aux Lane**

PM-R4.35/R5.15 (0.8 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	220	\$1,250	\$275,000
2		STORMWATER ITEMS	LS	LUMP SUM	\$320,000	\$320,000
3	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$40,000	\$40,000
4	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$400,000	\$400,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$80,000	\$80,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS	LM	0.0	\$1,900,000	\$0
7		Increased cost for structural section added to the outside PM-4.35 to 5.15 add 15%	LM	1.6	\$2,185,000	\$3,496,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$200,000	\$200,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$400,000	\$400,000
10	860930	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$25,000	\$25,000
12		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$0	\$0
13		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$0	\$0
					Roadway Subtotal	\$5,400,000
		MOBILIZATION 10%				\$540,000
		SUPPLEMENTAL WORK 2%				\$108,000
		CONTINGENCIES 22%				\$1,330,560
14		Less effective production for outside widening portion - increase costs by 30%			\$1,048,800	\$1,049,000
					ROADWAY TOTAL	\$9,000,000
		Structures items include 7% mobilization and 25% contingency				
		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	0	\$430	\$0
15		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	7,446	\$500	\$3,723,000
16		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB widen by 17 ft each direction	SQFT	680	\$100	\$68,000
17		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	4,046	\$350	\$1,416,100
		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89	SQFT	0	\$350	\$0
					BRIDGE TOTAL	\$6,000,000
		RIGHT OF WAY			\$400,000	\$400,000
					TOTAL (ROUNDED)	\$15,400,000

Alt D (2.1)**Big Easy**

PM-R6.0/R11.2 (5.2 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	120	\$1,250	\$150,000
2		STORMWATER ITEMS	LS	LUMP SUM	\$320,000	\$320,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$40,000	\$40,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$400,000	\$400,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$80,000	\$80,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS	LM	10.4	\$1,900,000	\$19,760,000
7		Concrete median barrier, on paved structural section INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	4.8	\$600,000	\$2,880,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$200,000	\$200,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$400,000	\$400,000
10	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$25,000	\$25,000
					Roadway Subtotal	\$24,400,000
		MOBILIZATION 10%				\$2,440,000
		SUPPLEMENTAL WORK 2%				\$488,000
		CONTINGENCIES 22%				\$6,012,160
					ROADWAY TOTAL	\$34,000,000
		Structures items include 7% mobilization and 25% contingency				
12		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	0	\$430	\$0
13		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	0	\$500	\$0
14		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB widen by 17 ft each direction	SQFT	0	\$100	\$0
15		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	0	\$350	\$0
16		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
17		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
18		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89	SQFT	0	\$350	\$0
					BRIDGE TOTAL	\$0
		RIGHT OF WAY			\$130,000	\$130,000
					TOTAL (ROUNDED)	\$34,130,000

Alt E (VA 1.3)

Big Easy + Aux Lane

PM-R4.35/R5.15 & PM-R6.0/11.2 (6.0 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
		Big Easy Portion				
1	70018	TIME-RELATED OVERHEAD	WDAY	220	\$1,250	\$275,000
2		STORMWATER ITEMS	LS	LUMP SUM	\$320,000	\$320,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$40,000	\$40,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$400,000	\$400,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$80,000	\$80,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS	LM	10.4	\$1,900,000	\$19,760,000
7		Concrete median barrier, on paved structural section INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	4.8	\$600,000	\$2,880,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$200,000	\$200,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$400,000	\$400,000
10	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$60,000	\$60,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$25,000	\$25,000
		Aux Lane Portion				
12		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS	LM	0.0	\$1,900,000	\$0
13		Increased cost for structural section added to the outside PM-4.35 to 5.15 add 10%	LM	1.6	\$2,090,000	\$3,344,000
14		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$100,000	\$100,000
15	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
16		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$25,000	\$25,000
					Roadway Subtotal	\$28,000,000
		MOBILIZATION 10%				\$2,800,000
		SUPPLEMENTAL WORK 2%				\$560,000
		CONTINGENCIES 22%				\$6,899,200
20		Less effective production for outside widening portion - increase costs by 30%			\$1,003,200	\$1,004,000
					ROADWAY TOTAL	\$40,000,000
		Structures items include 7% mobilization and 25% contingency				
		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	0	\$430	\$0
17		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	7,446	\$500	\$3,723,000
18		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB widen by 17 ft each direction	SQFT	680	\$100	\$68,000
19		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	4,046	\$350	\$1,416,100
		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89	SQFT	0	\$350	\$0
					BRIDGE TOTAL	\$6,000,000
		RIGHT OF WAY			\$400,000	\$400,000
					TOTAL (ROUNDED)	\$46,400,000

Alt F (VA 2.2)**Little Easy**

PM-R8.2/R11.2 (3.0 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	90	\$1,250	\$112,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$320,000	\$320,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$40,000	\$40,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$400,000	\$400,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$80,000	\$80,000
6		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS	LM	6.0	\$1,900,000	\$11,400,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$200,000	\$200,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$400,000	\$400,000
10	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$25,000	\$25,000
					Roadway Subtotal	\$13,100,000
		MOBILIZATION 10%				\$1,310,000
		SUPPLEMENTAL WORK 2%				\$262,000
		CONTINGENCIES 22%				\$3,227,840
					ROADWAY TOTAL	\$18,000,000
		Structures items include 7% mobilization and 25% contingency				
12		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	0	\$430	\$0
13		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	0	\$500	\$0
14		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB widen by 17 ft each direction	SQFT	0	\$100	\$0
15		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M widen each bridge by 17 ft	SQFT	0	\$350	\$0
16		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
17		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M	SQFT	0	\$430	\$0
18		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89	SQFT	0	\$350	\$0
					BRIDGE TOTAL	\$0
		RIGHT OF WAY			\$130,000	\$130,000
					TOTAL (ROUNDED)	\$18,130,000

Alt G (VA 2.4A)

Anderson First - Inside Widening

PM-R4.3/R7.5 (3.2 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
		ROADWAY ELEMENTS: 12' LANE 10' SHOULDER, HICB, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS				
6		concrete barrier on paved tent section median	LM	6.1	\$1,900,000	\$11,590,000
		Concrete median barrier, on paved structural section				
7		INCLUDES CB, FULL STRUCTURAL SECTION AND DRAINAGE (NO RETENTION)	LM	6.1	\$600,000	\$3,660,000
8		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$200,000	\$200,000
9		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$400,000	\$400,000
10	860930	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
11		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$650,000	\$650,000
12		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$150,000	\$150,000
13		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$100,000	\$100,000
					Roadway Subtotal	\$18,300,000
		MOBILIZATION 10%				\$1,830,000
		SUPPLEMENTAL WORK 2%				\$366,000
		CONTINGENCIES 22%				\$4,509,120
					ROADWAY TOTAL	\$26,000,000
		Structures items include 7% mobilization and 25% contingency				
14		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	4,777	\$335	\$1,600,396
15		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	10,359	\$375	\$3,884,513
16		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 LG RCB NO IMPACT AT MEDIAN	SQFT	0	\$100	\$0
17		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	5,629	\$275	\$1,547,893
18		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,717	\$335	\$2,250,061
19		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO REQ'M & DECK MEDIAN	SQFT	6,527	\$335	\$2,186,679
20		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 DECK MEDIAN	SQFT	2,791	\$275	\$767,443
					BRIDGE TOTAL	\$13,000,000
		RIGHT OF WAY			130,000	\$130,000
					TOTAL (ROUNDED)	\$39,130,000

Alt H (VA 2.4B)

Anderson First - Maintain Wide Median

PM-R4.1/R7.5 (3.4 miles)

NO.	ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
1	70018	TIME-RELATED OVERHEAD	WDAY	330	\$1,250	\$412,500
2		STORMWATER ITEMS	LS	LUMP SUM	\$400,000	\$400,000
3	1E+05	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	\$50,000	\$50,000
4	1E+05	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	\$500,000	\$500,000
5		CONSTRUCTION STAGING ELEMENTS	LS	LUMP SUM	\$100,000	\$100,000
6		RETAINING WALLS	SQFT	40,000	\$75	\$3,000,000
7		Soundwalls 12 ft x 6300 ft	Mile	0.15	\$2,800,000	\$420,000
8		ROADWAY ELEMENTS: 12' LANE 10' SHLDR, HTCBL, STAGING, TEMP AND FINISHED STRIPE, NORMAL DRAINAGE ITEMS depressed unpaved median, cable barrier	LM	0.0	\$1,900,000	\$0
9		Increased cost for structural section added to the outside PM-4.1 to 7.5 add 15%	LM	6.5	\$2,185,000	\$14,202,500
10		MODIFY 3 ONRAMPS	LS	LUMP SUM	\$750,000	\$750,000
11		MODIFY 3 OFFRAMPS	LS	LUMP SUM	\$750,000	\$750,000
12		ADDITIONAL DRAINAGE ITEMS	LS	LUMP SUM	\$250,000	\$250,000
13		ROADSIDE SIGN ELEMENTS	LS	LUMP SUM	\$500,000	\$500,000
14	9E+05	TRAFFIC MONITORING STATION	LS	LUMP SUM	\$75,000	\$75,000
15		ADJUST/RELOCATE ITS ELEMENTS	LS	LUMP SUM	\$50,000	\$50,000
16		VERTICAL CLEARANCE IMPROVEMENT - BALLS FERRY	LS	LUMP SUM	\$100,000	\$100,000
17		VERTICAL CLEARANCE IMPROVEMENT - NORTH STREET	LS	LUMP SUM	\$150,000	\$150,000
18		VERTICAL CLEARANCE IMPROVEMENT - DESCHUTES	LS	LUMP SUM	\$100,000	\$100,000
19		LANDSCAPING	LS	LUMP SUM	\$500,000	\$500,000
20						\$0
21		Soundwalls 12 ft x 750 ft	Mile	0.15	2,800,000	420,000
					Roadway Subtotal	\$22,800,000
		MOBILIZATION 10%				\$2,280,000
		SUPPLEMENTAL WORK 2%				\$456,000
		CONTINGENCIES 22%				\$5,617,920
22		Less effective production for outside widening portion - increase costs by 30%			\$4,260,750	\$4,261,000
					ROADWAY TOTAL	\$36,000,000
		Structures items include 7% mobilization and 25% contingency				
22		STRUCTURE 1&2 (DESCHUTES RD UC 06-0145L/R) PM R4.29 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	3,434	\$430	\$1,476,620
23		STRUCTURE 2&3 (SOUTH ANDERSON OH, 06-0098L/R) PM R4.57 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	7,446	\$500	\$3,723,000
24		STRUCTURE 4 (ANDERSON CK OVERFLOW 06-0168) PM R4.92 Large RCB, widen by 17 ft each direction	SQFT	680	\$100	\$68,000
25		STRUCTURE 5&6 (ANDERSON CREEK, 06-0142L/R) PM R5.04 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,046	\$350	\$1,416,100
26		STRUCTURE 7&8 (BALLS FERRY UC 06-0140L/R) PM R5.29 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,828	\$430	\$2,076,040
27		STRUCTURE 9&10 (NORTH STREET UC 06-0141L/R) PM R5.64 SEISMIC RETRO, widen each bridge by 17 ft	SQFT	4,692	\$430	\$2,017,560
28		STRUCTURE 11&12 (TORMEY DRAIN 06-0144L/R) PM R5.89 widen each bridge by 17 ft	SQFT	2,006	\$350	\$702,100
					BRIDGE TOTAL	\$12,000,000
		RIGHT OF WAY			\$400,000	\$400,000
					TOTAL (ROUNDED)	\$48,400,000

TRANSPORTATION MANAGEMENT PLAN DATA SHEET

To: Dale Widner, PE
District 2 – Advance Planning
MS #4

Date: June 21, 2011

File: SHA-5-PM R2.0/R12.0

EFIS: 0200020191

EA: 02-4C402K

From: Department of Transportation
District 2 - Office of Traffic Management

Work: Shasta I-5 Gap Closure

1. POLICY

The Caltrans Deputy Directive titled "Transportation Management Plans" (DD-60) establishes the current policy for mitigating traffic impacts resulting from construction, maintenance, encroachment permit, planned emergency restoration, locally or specially funded, or other activities. The directive states that Transportation Management Plans (TMPs) and contingency plans shall be completed for all work activities on the State highway system. **The purpose of this Transportation Management Plan Data Sheet is to ensure all anticipated TMP costs are included in the Project Initiation Document (PID).**

2. SCOPE OF WORK

This STIP project proposes to add a lane for each direction of travel on I-5 to fill the gap remaining between the South Redding 6-lane and the Cottonwood Hills Truck Climbing Lane projects. The project limits begin just north of the Deschutes Interchange/SR 273 SEP and extend to just south of the So Bonnyview/Churn Creek Interchange. It is not known at this time if widening will occur to the inside or outside. The following list contains most of the work that may be included:

Roadway:

- Removal of the existing shoulder (either inside or outside)
- Relocate utilities
- Remove/replace cable median barrier (if widening to inside)
- Earthwork and grading
- Construct new structural section for the additional 12 ft wide lanes and new 10 ft wide inside shoulders
- Install rumble strip on new shoulder
- Place AC overlay across full width of roadway
- Place shoulder backing on shoulder
- Replace/upgrade existing drainage features
- Install/replace/upgrade MBGR as needed
- Install/replace/upgrade signs, markers, and delineation as needed

Ramps:

- No work planned on ramps, except if widening to outside occurs

Structures:

- Widen 6 pairs of structures to accommodate the additional lane and shoulder; replace bridge railing, replace approach/departure slabs,
- All Structures: Possibly place polyester concrete overlay or methacrylate on bridge decks.

Any needed fill material will be imported from within the project limits (Cottonwood Hill adjacent to NB shoulder).

SCHEDULE: It is estimated that two seasons will be required to complete the project, with construction tentatively scheduled for 2017 and 2018.

3. FACILITY

I-5 MAINLINE: Interstate-5 is a multi-lane freeway of divided alignment on a primarily tangent, level profile providing good sight distance. By the time this project goes to construction in 2017, in this gap segment, there will remain two 12 ft lanes with 5 ft wide inside and 10 ft wide outside shoulders, and a cable barrier in the unpaved median. The speed limit is 70 mph on this segment of I-5.

Attachment H
Traffic Management Plan
Data Sheet

3. FACILITY (Cont.)

STRUCTURES: The following structures are within the project limits. The PE has indicated that only 13 of these will be subject to widening (indicated by shaded rows).

NAME	LOC	NO.	LENGTH (FT)	WIDTH (FT)	VC (ft)
So Anderson SEP	PM R3.82	06-0139L	159	41	15.2
So Anderson SEP	PM R3.82	06-0139R	159	41	15.1
Deschutes Rd/Prime Outlets UC	PM R4.29	06-0145L	101	41	14.9
Deschutes Rd/Prime Outlets UC	PM R4.29	06-0145R	101	41	15.9
So Anderson OH (RR)	PM R4.57	06-0098L	219	41	23.1
So Anderson OH (RR)	PM R4.57	06-0098R	219	41	23.1
Anderson Creek OF	PM R4.92	06-0168	27	0.0	NA
Anderson Creek Br	PM R5.04	06-0142L	119	52	NA
Anderson Creek Br	PM R5.04	06-0142R	119	45	NA
Balls Ferry UC	PM R5.29	06-0140L	142	41	14.7
Balls Ferry UC	PM R5.29	06-0140R	142	41	15.8
North St UC	PM R5.64	06-0141L	138	41	14.5
North St UC	PM R5.64	06-0141R	138	41	14.6
Tormey Drain	PM R5.89	06-0144L	59	49	NA
Tormey Drain	PM R5.89	06-0144R	59	54	NA
Riverside Ave OC	PM R6.74	06-0146	209	37	16.1
Sacramento River Br	PM R6.98	06-0128	617	131	NA
Knighton Rd OC	PM R9.77	06-0134	258	40	16.2
Smith Road OC	PM R10.85	06-0138	238	40	16.1

MAINLINE TRAFFIC VOLUMES: Current and projected traffic volumes are shown in the following tables:

CURRENT TRAFFIC VOLUMES							
SEGMENT	AADT 2009	NB PEAK VOL		SB PEAK VOL		TRUCK VOL	PEAK VOL DATA SOURCE
		WD	WE	WD	WE		
SR 273 SEP (Beginning of Project)	39,000	2,104	1,986	2,372	2,096	12%	TMS #272, SHA-05-PM R3.83, August 2009
Anderson (Middle of Project)	48,000	1,831	1,704	2,855	2,418	12%	TMS #239, SHA-05-PM 7.08, August 2009
Churn Creek Rd I/C (End of Project)	53,000	2,310	2,198	2,322	2,402	13%	TMS #298, SHA-05-PM 13.932 August 2008

WD = Weekday; WE = Weekend

PROJECTED MAINLINE TRAFFIC VOLUMES: For the purpose of performing a preliminary evaluation of traffic impacts and potential mitigation measures, current traffic volumes were projected to the tentative construction year of 2017 based on a 1.29% historical growth rate trend (*this does not reflect traffic growth resulting from future development*).

2017 PROJECTED TRAFFIC VOLUMES							
SEGMENT	ADT 2017	NB PEAK VOL		SB PEAK VOL		TRUCK VOL	PEAK VOL DATA SOURCE
		WD	WE	WD	WE		
SR 273 SEP (Beginning of Project)	50,300	2,302	2,172	2,595	2,293	15%	TMS #272, SHA-05-PM R3.83, August 2009
Anderson (Middle of Project)	64,000	2,003	1,864	3,123	2,645	15%	TMS #239, SHA-05-PM 7.08, August 2009
Churn Creek Rd I/C (End of Project)	68,370	2,592	2,467	2,606	2,696	17%	TMS #298, SHA-05-PM 13.932 August 2008

WD = Weekday; WE = Weekend

3. FACILITY (Cont.)

RAMP TRAFFIC VOLUMES: The following ramps are within the project limits. The PE has indicated that some ramps may be impacted only if widening occurs to the outside (shaded rows).

NAME	LOCATION PM	ADT (2007)	PEAK VPH* WD	PEAK VPH* WE	DATA SOURCE
No Cottonwood NB On-Ramp	PM 2.076	2,300	215	137	TMS #R192, APR 2010
No Cottonwood SB Off-Ramp	PM 2.286	3,074	337	229	TMS #R193, APR 2007
SR 273 NB Off-Ramp	PM R3.393	4,968	426	427	TMS #R194, APR 2010
SR 273 SB On-Ramp	PM R3.564	5,800	542	524	TMS #R195, APR 2010
Deschutes NB On-Ramp	PM R4.422	4,731	435	387	TMS #R196, APR 2010
Deschutes SB Off-Ramp	PM R4.446	5,484	546	465	TMS #R197, JUNE 2010
Balls Ferry NB Off-Ramp	PM R5.099	4,576	447	433	TMS #R198, APR 2010
Balls Ferry SB On-Ramp	PM R5.118	5,540	517	442	TMS #R199, APR 2010
North St NB On-Ramp	PM R5.832	4,391	423	330	TMS # R200, APR 2010
North St SB Off-Ramp	PM R5.833	4,395	495	357	TMS #R201, APR 2010
Riverside Ave NB Off-Ramp	PM R6.526	2,927	254	184	TMS #R202, APR 2010
Riverside Ave SB On-Ramp	PM R6.603	2,465	260	203	TMS #R203, APR 2010
Riverside Ave NB On-Ramp	PM R6.697	3,166	309	273	TMS #R204, APR 2010
Riverside Ave SB Off-Ramp	PM R6.90	3,456	327	345	TMS #R205, APR 2010
Knighton Rd NB Off-Ramp	PM R9.565	2,074	189	149	TMS #R206, APR 2010
Knighton Rd SB On-Ramp	PM R9.647	2,038	191	132	TMS #R207, APR 2010
Knighton Rd NB On-Ramp	PM R9.897	3,585	248	219	TMS #R208, APR 2010
Knighton Rd SB Off-Ramp	PM R9.969	3,189	340	198	TMS #R209, UNE 2007
So. Bonnyview Rd NB Off-Ramp	PM R11.927	5,337	549	395	TMS #R210, APR 2010
So Bonnyview Rd SB On-Ramp	PM R11.961	5,603	622	372	TMS #R211, APR 2010

WD=Weekday, WE=Weekend. Peak VPH is the peak hour volume between 6 a.m. and 6 p.m.

CENSUS LOOPS: As shown in the following table, there are mainline and ramp loops within the project limits. Further information regarding this equipment can be obtained from Karen Carmo, Traffic Census, at 530-225-3042.

ID	ACTUAL LOCATION	TYPE	DESCRIPTION	IMPACT?
#R192	SHA-05-PM 2.076	Ramp	NB on-ramp to No Cottonwood (1 loop)	No - no work on ramps planned
#R193	SHA-05-PM 2.286	Ramp	SB off-ramp to No Cottonwood (2 loops)	No - no work on ramps planned
#R194	SHA-05-PM R3.393	Ramp	NB off-ramp to SR 273 (1 loop)	No - no work on ramps planned
#R195	SHA-05-PM R3.564	Ramp	SB on-ramp from SR 273 (1 loop)	No - no work on ramps planned
#272	SHA-05-PM R3.46	Control	Mainline (7 loops)	Loops will need to be replaced
#R196	SHA-05-PM R4.43	Ramp	Deschutes NB on-ramp (1 loop)	No - no work on ramps planned
#R197	SHA-05-PM R4.45	Ramp	Deschutes SB off-ramp (1 loop)	No - no work on ramps planned
#R198	SHA-05-PM R5.30	Ramp	Balls Ferry NB off-ramp (3 loops)	No - no work on ramps planned
#R199	SHA-05-PM R5.27	Ramp	Balls Ferry SB on-ramp (1 loop)	No - no work on ramps planned
#R200	SHA-05-PM R5.71	Ramp	North St NB on-ramp (1 loop)	No - no work on ramps planned
#R201	SHA-05-PM R5.79	Ramp	North St SB off-ramp (1 loop)	No - no work on ramps planned
#R202	SHA-05-PM R6.69	Ramp	Riverside Ave NB off-ramp (1 loop)	No - no work on ramps planned
#R203	SHA-05-PM R6.72	Ramp	Riverside Ave SB on-ramp (1 loop)	No - no work on ramps planned
#R204	SHA-05-PM R6.697	Ramp	Riverside Ave NB on-ramp (1 loop)	No - no work on ramps planned
#R205	SHA-05-PM R6.78	Ramp	Riverside Ave SB off-ramp (1 loop)	No - no work on ramps planned
#239	SHA-05-PM R7.8	Trend	Mainline (4 loops)	Loops will need to be replaced*
#R206	SHA-05-PM 9.69	Ramp	Knighton Rd NB off-ramp (1 loop)	No - no work on ramps planned
#R207	SHA-05-PM 9.97	Ramp	Knighton Rd SB on-ramp (1 loop)	No - no work on ramps planned

3. FACILITY (Cont.)

CENSUS LOOPS (Cont.)

ID	ACTUAL LOCATION	TYPE	DESCRIPTION	IMPACT?
#R208	SHA-05-PM 9.8	Ramp	Knighten Rd NB on-ramp (1 loop)	No - no work on ramps planned
#212	SHA-05-PM 9.772	Count	Mainline (4 loops)	Loops will need to be replaced
#R209	SHA-05-PM 9.9	Ramp	Knighten Rd SB off-ramp (1 loop)	No - no work on ramps planned
#R210	SHA-05-PM R12.114	Ramp	So Bonnyview NB off-ramp (2 loops)	No - no work on ramps planned
#R211	SHA-05-PM R11.961	Ramp	So. Bonnyview SB on-ramp (1 loop)	No - no work on ramps planned

*TMS #239 needs to be upgraded to a classification station with piezos, new cabinet & pad.

ITS FIELD ELEMENTS: The following ITS field elements exist within the project limits (or may be constructed by 2017). In addition, there is fiber optic cable in the median of I-5 running between the Deschutes I/C and the North Market I/C (including hung under the structures within the project limits). Further information can be obtained from Ian Turnbull, Office of ITS Engineering & Support at 530-225-3320.

ELEMENT	LOCATION	DESCRIPTION	IMPACT?
CCTV	SHA-05-PM R4.29	Deschutes I/C	Yes - Fiber communications disruption likely
CCTV	SHA-05-PM R6.72	Riverside I/C	Yes - Fiber communications disruption likely
CMS	SHA-05-PM R6.74	On Riverside Ave OC (For NB traffic)	Yes - Fiber communications disruption likely
MVDS	SHA-05-PM R7.40	In median (solar powered)	May need to be relocated if widening occurs toward the median
MVDS	SHA-05-PM R8.34	In median (solar powered)	May need to be relocated if widening occurs toward the median
MVDS	SHA-05-PM R9.33	In median (solar powered)	May need to be relocated if widening occurs toward the median
CMS	SHA-05-PM R10.86	On Smith Rd OC (For NB traffic)	Yes - Fiber communications disruption likely
CMS	SHA-05-PM R10.86	On Smith Rd OC (For SB traffic)	Yes - Fiber communications disruption likely
CCTV	SHA-05-PM R12.15	So Bonnyview I/C	Yes - Fiber communications disruption likely

4. TRAFFIC IMPACTS

MAINLINE: Traffic impacts cannot be fully determined at this time because it is not known if widening will occur to the inside or outside. However, it is likely that a combination of Std Plan T-10 lane closures and stage construction with K-rail will be used to build this project. Stage construction that provides two 12 ft lanes, plus reduced shoulder widths, should not create additional significant impacts because existing capacity will be maintained (some Permit trucks may be impacted however, see Truck section of this TMP). Any reduction in capacity to a single lane during daytime hours (regardless of weekday or weekend) will create significant queuing and delays; the same closure during night time hours could be accommodated without significant traffic impacts. Any 2017 construction scenario that would reduce a direction of I-5 to a single lane could be accommodated only during a 6-8 hour night time work window. Also, if the Contractor carries out multiple operations at different locations within the project limits, several concurrent closures may compound queuing, as well as create traffic control conflicts.

OTHER CONSIDERATIONS: If widening occurs in the median area, trucks and equipment entering and leaving the work zone must do so from the #1 lane. Merging slower moving trucks and equipment with higher speed vehicles (especially during high volume daytime hours) is likely to cause traffic conflicts and congestion. Also, during mainline traffic shift, ramp merge movements and geometrics may be affected. In addition, because the median will be unavailable and the outside paved shoulder width will be reduced during construction, there will be no area available for motorists to get off the mainline during break-downs or for use by emergency vehicles to access incidents. Thus, when these events occur, the I-5 mainline will be reduced to a single lane in the direction of travel (or perhaps both lanes closed). During most daytime hours, this will cause significant congestion; and experience has shown that although queues build quickly they require hours to clear.

4. TRAFFIC IMPACTS (Cont.)

RAMPS: Ramp impacts cannot be determined until it is determined if widening occurs to the inside or outside of I-5. Minimal ramp impacts will result from median widening; however if widening occurs to the outside some full ramp closures may be required. When a ramp is closed, traffic will be detoured to the next available ramp. Due to the moderate to high volumes at these ramps, a daytime ramp closure (or extended closure) and detour would create significant congestion on the detour route and on the I-5 mainline at the detour interchange.

TRUCKS: I-5 is part of the STAA National Network, able to accommodate the following: California Legal Trucks (the most common trucks) up to 8.5 ft wide, Annual permits trucks up to 12 ft wide, Single Trip permit trucks up to 14 ft wide, and sometimes Variance Permit trucks wider than 14 ft. This project will place K-rail between the work zone and the open traffic lane, resulting in a reduced shoulder width. Truck restrictions will result unless adequate horizontal clearance is provided during all project operations. Also, widening of the Deschutes/Prime Outlets UC, Balls Ferry UC, and North Street UC may require falsework over each of these local roads, respectively. If reduced vertical clearance is created by falsework placement, truck restrictions will result and impacted trucks will be required to use an alternate route.

LOCAL ROADS: As indicated in the previous paragraph, some lane closures or full closure of local roads under a UC structure may be required during widening operations. Although no hourly traffic are available, traffic volumes are estimated to be moderate. Daytime lane closures could be accommodated; however full closure would be inconvenient to local motorists. Also, during ramp closures local roads may be part of a detour route. The increase in traffic volumes on local roads may deteriorate roads if the detour is in effect for a long period of time, or cause congestion along the detour route.

PEDESTRIANS & BICYCLES: Pedestrians and bicycles are prohibited on this section of I-5, therefore no impacts to these groups on the mainline should occur. However, falsework and shoring placement needed to widen the UC structures may require long-term closure of the sidewalks beneath the structures which would be a significant impact to pedestrians.

ITS FIELD ELEMENTS: ITS field elements located within areas of construction may require replacement or relocation (this may include foundations, poles, supports, electrical and fiber optic conduit, etc). Also, during construction, elements may be out of operation. The fiber communications backbone will require replacement at all bridge crossings if widening occurs to the median. The PE should contact Ian Turnbull, Office of ITS Engineering & Support at 530-225-3320 to identify specific impacts to each ITS field element within the project limits, and to include associated costs for replacement or relocation in the project estimate.

CENSUS EQUIPMENT: Existing ramp loops shall be protected in-place. However, all mainline loops will need to be replaced (plus an additional loop will need for the new lane), and TMS #239 should be upgraded. The PE must include these costs in the project estimate. The PE should contact Karen Carmo, Traffic Census at 530-225-3042 to obtain further information regarding replacement costs.

CONSTRUCTION COORDINATION: Per the D2 DTM policy, closures on multilane facilities are typically not allowed within 3.0 mi of another closure in the same direction of travel to avoid traffic control conflicts and to allow traffic queues to disperse between closures, thereby minimizing delays. Assuming construction will occur between the summer of 2017 and fall of 2018, the following project may be in concurrent construction:

Project EA	Location	Scope
02-4E0304	SHA-05-PM 3.3/3.80 SHA-273-PM 3.8/7.2 & 11.0/12.6	Anderson 273 3R Roadway Rehabilitation

Although the above project focuses on SR 273, it also includes work on the I-5 NB off-ramp to SR 273 and the SB on-ramp from SR 273. Also, traffic control signage for ramp closures and detours could be in conflict.

5. TRAFFIC IMPACT MITIGATION

LANE CLOSURES: In general, lane closures on multi-lane freeways are not allowed when the capacity of the remaining open lanes is exceeded by traffic volumes, or when available lane width is not adequate for expected permit truck traffic. Based upon preliminary evaluation of the expected 2017 traffic volumes for this section of I-5, lane closures will only be allowed during a 10-12 hour night time window. This lane closure window may be slightly extended *if traffic surveillance efforts are provided by the Contractor*. The length of a lane closures will likely be restricted to 1.0 mile or less, with only one closure will be allowed in the direction of travel. When operations are not in progress, not less than two 12 ft lanes (plus any existing auxiliary lanes) must be provided. No closures will be allowed designated legal holidays, the day preceding a designated legal holiday, or any local special events to be determined in the TMP. Lane closure charts will apply.

DESIGN & CONSTRUCTION STRATEGIES:

- The PE must verify that shoulder has the structural strength to carry the volume of traffic and trucks expected during construction. In addition the PE must verify if correction of the shoulder cross-slope is required before placing traffic on it. It may be necessary to construct a new structural section or to undertake other actions prior to shifting traffic.
- To the extent possible and practicable, provide full capacity during peak volumes times; this means a minimum of two through lanes on the mainline (plus any auxiliary lanes present) and ensuring that all ramps are open during all daytime hours, designated legal holidays, and any special event date identified in the TMP.
- Maximize traffic opening width to accommodate the majority of permit trucks and provide as much shoulder width as possible for emergency situations.
- Complete (or mostly complete) bridge widening prior to starting roadway widening, K-rail stage construction to minimize narrow widths.
- Limit length of roadway widening, k-rail operations so the tight shoulder conditions do not exist for long periods of time.

CONSTRUCTION ACCESS/EGRESS: The PE should evaluate merge movements associated with construction equipment access/egress from the median. It may be necessary to develop an alternative median access/egress to avoid affecting daytime traffic flow (i.e., construction of long deceleration or acceleration lanes).

TRAFFIC CONTROL SURVEILLANCE (QUEUE WARNING): If a longer work window (extending into daytime hours not normally allowed) is required to complete certain construction operations, the Contractor should provide TMT-type support during hours specified in the TMP. This support includes queue monitoring, operating PCMSs, and maintaining the traffic control system.

FREEWAY SERVICE PATROL (FSP): When there is insufficient paved shoulder width for motorists to pull-off the mainline, FSP or an FSP-type service (i.e., contracted tow service) should be provided during most daytime hours to quickly respond to and/or remove disabled vehicles and return the facility to full capacity.

RAMP CLOSURES & DETOURS: The PE should evaluate merge movements to/from ramps when the traffic shift in effect to ensure that adequate merge length is provided. It may be necessary that some ramps be closed when the traffic shift is in effect for lack of adequate merge space. Based on the high traffic volumes expected for all ramps, ramp closures will be restricted to night time hours. Ramp closures will NOT be allowed during daytime hours (regardless of weekday or weekend). No closures will be allowed designated legal holidays, the day preceding a designated legal holiday, or any local special events to be determined in the TMP. Ramp closure charts will apply. **No extended ramp closures (i.e., 24-hour) will be allowed unless approved by the District Lane Closure Committee.** When operations are not in progress, a minimum of 14 ft paved width shall be provided (i.e., no less than one 12 ft ramp lane plus a portion of the paved shoulder). The TMP will limit the number of times a ramp connection may be closed. Closure of two consecutive ramps in the same time direction of travel will not be allowed. The PE shall include Detour Plans for each planned ramp closure (refer to the District 2 Ramp Detour detail). An encroachment permit will be required from the local agency if any local roadways are used as part of a detour route during ramp closures.

LOCAL ROADS: The PE will be required to obtain an encroachment permit for any detours or construction operations that occur on a local roadway.

5. TRAFFIC IMPACT MITIGATION (Cont.)

TRUCKS:

- **Mainline** - To accommodate truck passage, a minimum of two 12 ft lanes plus 1 ft inside and 6 ft outside shoulder must be provided (29 ft wide traffic opening). The PE must verify that adequate width exists throughout the project limits to provide this width (including structures). When there is a reduction in existing horizontal and vertical clearance, the RE will be required to notify the HQ Transportation Permits at least 15 days in advance of the change. **NOTE:** The PE and the Materials Lab must confirm that the structural section of the right/outside shoulder is adequate to handle truck traffic.
- **Ramps** - To accommodate truck passage, a minimum of 14 ft pavement width must be provided. If this is not possible and the ramp is closed, the proposed detour route must be able to accommodate trucks.

PEDESTRIANS: On local roadways under the UC structures, a least one sidewalk or paved shoulder shall remain available to pedestrians during construction. The PE will required to include a pedestrian detour detail in the plans.

COZEEP AND REDUCED SPEED ZONE: Due to the high approach speeds, high volumes of traffic, the close proximity of personnel and equipment to traffic, a reduced speed zone may be warranted for all Std Plan T-10 lane closures. The PE should confer with the Carl Mindus, NR Construction Safety, and Kristi Burney, Traffic Safety at 530-225-3113 to determine applicability of COZEEP and a reduced speed zone for this project. If warranted, the PE should include funds for COZEEP in the project estimate and include a COZEEP/REDUCED SPEED ZONE detail in the plans.

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMSs): Due to the high approach speeds, the high traffic volumes, and need for night work, portable CMSs are recommended for this project. Portable CMSs are recommended for:

- All Std Plan T-10 lane closures
- The 12-hour advance notification of planned ramp closure as well as during the actual ramp closure (Refer to D2 Ramp Closure Detail)
- For COZEEP/Speed Reduction (Refer D2 COZEEP/Speed Reduction detail on placement of portable CMSs)
- As part of the signing to alert motorists of slower moving trucks merging onto the mainline

ITS FIELD ELEMENTS: The PE should include repair/replacement/relocation costs for impacted existing ITS equipment and fiber communication facilities described in Section 3. Further information on ITS equipment can be obtained from Ian Turnbull, ITS Engineering & Support at 530-225-3320.

CENSUS EQUIPMENT: The PE should include funds to replace damaged census loops, and to install loops on the new lanes. Karen Carmo, Traffic Census, should be contacted at 530-225-3042 to obtain further information.

COORDINATE CONSTRUCTION: For multilane facilities, the D2 DTM policy is that lane closures shall be spaced no closer than 3.0 mi in the same direction of travel to avoid traffic control conflicts and to allow dispersal of queues between closures. Based on the current work plan status, there is only one other nearby project scheduled for construction in 2017/18. Throughout project development, project status will be as the 2017/18 construction season nears in order to identify any additional potential conflicts. Projects found to be in conflict will be required to be rescheduled.

PROJECT-SPECIFIC MEDIA RELEASE: The PE should include funds to allow the RE and D2 PIO to develop and issue advance notification of planned lane and ramp closures to the local media (news, radio, and newsprint) as needed.

WORKER SAFETY MEDIA CAMPAIGNS - Worker safety media campaigns have been shown to reduce work zone vehicle collisions. Reducing work zone collisions will increase public and worker safety and reduce incident related congestion. With safety and reliability being the Departments number 1 and 2 goals respectively, it is appropriate for construction funding be set aside for worker safety media advertisements.


5. TRAFFIC IMPACT MITIGATION (Cont.)

COSTS: In addition to costs associated with typical Std Plan T-10 and Std Plan T-14 traffic control, the following shall be incorporated into the project estimate:

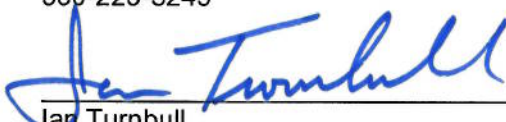
- **STAGE CONSTRUCTION:** Increased cost associated with more working days so that full capacity can be provided during daytime hours and designated legal holidays, and for completing bridge work prior to beginning roadway stage construction.
- **MEDIAN IMPROVEMENTS FOR CONSTRUCTION ACCESS/EGRESS** (if widening to inside): Include construction cost associated with acceleration and deceleration lanes.
- **SHOULDER IMPROVEMENTS TO ACCOMMODATE TRAFFIC SHIFT** (if needed): Include construction cost associated with new structural section (or for cross slope correction).
- **NIGHT WORK:** Increased unit costs for working at night for those operations that require lane or ramp closures.
- **DETOUR SIGNAGE:** Include any additional costs associated with ramp closure and detour signage.
- **PORTABLE CMSs:** As part of the traffic control system, include cost of PCMSs during lane closures, ramp closures, and COZEEP/speed zone reduction.
- **COZEEP:** Include costs for COZEEP during Std Plan T-10 lane closures (and possibly during Stage Construction if determined warranted by Kristi Burney and the CE).
- **TRAFFIC CONTROL SURVEILLANCE:** Include costs for the contractor to provide traffic control surveillance for operations that must unavoidably occur during hours when closures are not typically allowed.
- **FREEWAY SERVICE PATROL (FSP):** Include costs associated with providing FSP during most daytime hours (including weekdays and weekends) and designated legal holidays (if these cannot be avoided).
- **ITS FIELD ELEMENTS:** Include any additional costs associated with replacement or relocation of ITS field elements and fiber communication facilities. Contact Ian Turnbull, ITS Engineering & Support at 530-225-3320 for item cost information.
- **CENSUS EQUIPMENT:** Include costs for replacement, as well as for installations of additional loops in the new lanes. The PE should contact Karen Carmo, Traffic Census, 530-225-3042.
- **WORKER SAFETY MEDIA CAMPAIGN:** Include \$1,500 in item #066063-Transportation Management Plan Public Information for worker safety media campaigns.
- **TMP PUBLIC INFORMATION:** Include \$1,500 in item #066063-Transportation Management Plan Public Information for preparation of project-specific information to be distributed to the public and local media.
- **CONTINGENCY COSTS:** Contingency costs for equipment breakdown, shortage of materials, etc. should be included.

TMP: A TMP is required for this project and should be requested at a time when the design is complete enough to determine specific traffic impacts, but is early enough to make design changes/additions required for traffic mitigation. The TMP for this project will summarize the traditional traffic handling practices and other traffic mitigation strategies that will be implemented during construction that will include, but is not limited to: pre-notification of closures (Lane Closure Schedule), DTM evaluation of cumulative traffic corridor delays for multiple projects, California Highway Information Network (CHIN), Road Work Information Bulletin (RIB), Local Agency contacts, Permanent Changeable Message Sign (CMS) locations, permanent and portable Highway Advisory Radio (HAR) locations, CHP Commander contacts, incident response (accident, natural event) contacts, contingency plans, and maintenance contacts.

This TMP Data Sheet was prepared by Jan Meyer, ATP. I have personally reviewed this TMP Data Sheet and all supporting information. I certify that the assumptions are reasonable and proper subject to the limiting conditions set forth and I find the Data Sheet complete and current.


Clint Burkenpas
Chief, Office of Traffic Management
District 2
530-225-3245

6/22/11
Date


Ian Turnbull
Chief, Office of ITS Engineering & Support
District 2
530-225-3320

6/21/11
Date

*** SEE ATTACHED RESOURCE SPREADSHEET**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET



Date: June 27, 2011

02-Sha-5-PM 2.0/R12.0
E.A. 4C402
Shasta 5 Gap Closure

1. Right of Way Cost Estimate:

	Current Value Future Use	Escalation Rate	Escalated Value
A. Total Acquisition Cost	\$418,750	5%	\$505,197
B. Mitigation acquisition & credits	\$50,000	5%	\$60,322
C. Project Development Permit Fees	\$10,000	5%	\$12,064
Subtotal	\$478,750		\$577,584
D. Utility Relocation (State Share) (Owner's share: _____)	\$0		\$0
E. Relocation Assistance (RAP)	\$0		\$0
F. Clearance/Demolition	\$0		\$0
H. Title & Escrow	\$0		\$0
I. Total Estimated Right of Way Cost	\$478,750	Rounded	\$578,000
J. Construction Contract Work	\$0		

2. Current Date of Right of Way Certification

May 1, 2015

3. Parcel Data:

Type	Dual/Appr	Utilities	RR Involvements
X 0		U4 - 1 0	None
A 25		- 2 0	C&M Agrmt
B 0		- 3 0	Svc Contract
C 0	0	- 4 0	Easements
D 0	0	U5 - 7 10	Rights of Entry
		- 8 0	Clauses
		- 9 0	
Total 25			
Areas:			Misc. R/W Work
R/W: Unkown at this time			RAP Displ N/A
Excess: N/A	No. Excess Pcls: 0		Clear/Demo N/A
Mitigation: N/A			Const Permits N/A
			Condemnation 0
			USA Involvement No

Attachment I
Right of Way
Data Sheet

RIGHT OF WAY DATA SHEET

4. Are there any major items of construction contract work?
Yes _____ No X
5. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.).
Information provided to right of way engineering from district design is preliminary. The information provided allowed for an estimate of parcels, but no areas. The parcels to be acquired consist of small strips of land adjacent to the existing right of way on either side of the highway. The properties are zoned agricultural land and prime commercial. The rights needed consist of fee, utility easements and temporary easements. It is unknown what improvements are likely to be effected.
6. Are any properties acquired for this project expected to be rented, leased, or sold?
Yes _____ No X
7. Is there an effect on assessed valuation? Yes _____ Not Significant _____
No X
8. Are utility facilities or rights of way affected? Yes X No _____
Utility relocations are not anticipated; however, utility verifications will be required.
9. Are railroad facilities or rights of way affected? Yes X No _____
10. Were any previously unidentified sites with hazardous waste and/or material found?
Yes _____ None Evident X
11. Are RAP displacements required? Yes _____ No X
No. of single family _____ No. of business/nonprofit _____
No. of multi-family _____ No. of farms _____
Based on Draft/Final Relocation Impact Statement/Study dated N/A
it is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.
12. Are there material borrow and/or disposal sites required?
Yes _____ No X
13. Are there potential relinquishments and/or abandonments?
Yes _____ No X
14. Are there any existing and/or potential airspace sites?
Yes _____ No X
15. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if district proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated.)
Right of Way Lead Time will require a minimum of 16 months after we receive first appraisal maps, utility conflict maps, and the necessary environmental clearance and freeway agreements have been approved and obtained. Additionally a minimum of 13 months will be required after receiving the last appraisal map to Right of way for certification.

RIGHT OF WAY DATA SHEET

16. Is it anticipated that Caltrans will perform all Right of Way work?

Yes X No

Evaluation Prepared By:

Right of Way:

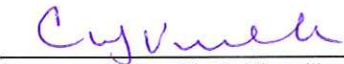

Jason Verduzco

Date

7/6/11

Reviewed By:

RW Project Coordinator:


Cindy Vincelli

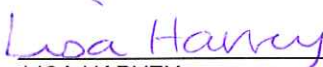
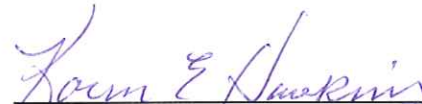
Date

7-6-11

I have personally reviewed this Right of Way Data Sheet and all supporting information. I certify that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and I find this Data Sheet to be complete and current.

RECOMMENDED FOR APPROVAL

APPROVED:


LISA HARVEY,
Senior Right of Way Agent
Project Delivery Branch
Redding
KAREN HAWKINS
North Region Right of Way Manager
Eureka/Redding7-6-2011
Date7/11/11
Date

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET

REVISED



Date: December 13, 2011

02-Sha-5-PM 2.0/R12.0
E.A. 4C402
Shasta 5 Gap Closure

1. Right of Way Cost Estimate: **Alternate No. B**

	Current Value Future Use	Escalation Rate	Escalated Value
A. Total Acquisition Cost	\$25,625	5%	\$30,225
B. Mitigation acquisition & credits	\$50,000	5%	\$58,975
C. Project Development Permit Fees	\$10,000	5%	\$11,795
Subtotal	\$85,625		\$100,994
D. Utility Relocation (State Share) (Owner's share: _____)	\$25,000	5%	\$29,487
E. Relocation Assistance (RAP)	\$0		\$0
F. Clearance/Demolition	\$0		\$0
H. Title & Escrow	\$0		\$0
I. Total Estimated Right of Way Cost	\$110,625	Rounded	\$130,000
J. Construction Contract Work	\$0		

2. Current Date of Right of Way Certification May 1, 2015

3. Parcel Data:

Type	Dual/Appr	Utilities	RR Involvements
X 0		U4 - 1 0	None
A 0		- 2 0	C&M Agrmt 1
B 0		- 3 0	Svc Contract 2
C 0	0	- 4 0	Easements
D 0	0	U5 - 7 10	Rights of Entry 1
		- 8 0	Clauses 1
		- 9 0	
Total 0			
Areas:			Misc. R/W Work
R/W:			RAP Displ N/A
Excess:	N/A	No. Excess Pcls: 0	Clear/Demo N/A
Mitigation:	N/A		Const Permits N/A
			Condemnation N/A
			USA Involvement No

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET

4. Are there any major items of construction contract work?

Yes _____ No X

5. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.).

No right of way required. All work is entirely within the median.

6. Are any properties acquired for this project expected to be rented, leased, or sold?

Yes _____ No X

7. Is there an effect on assessed valuation?

No X

Yes _____

Not Significant _____

8. Are utility facilities or rights of way affected?

Yes X

No _____

Utility relocations are not anticipated; however, utility verifications will be required.

9. Are railroad facilities or rights of way affected?

Yes X

No _____

Union Pacific RR, Deschutes Road Overhead Structure @ PM 4.57 +/-

10. Were any previously unidentified sites with hazardous waste and/or material found?

Yes _____

None Evident X

11. Are RAP displacements required?

Yes _____

No X

No. of single family _____

No. of business/nonprofit _____

No. of multi-family _____

No. of farms _____

Based on Draft/Final Relocation Impact Statement/Study dated N/A
it is anticipated that sufficient replacement housing (will/will not) be available without
Last Resort Housing.

12. Are there material borrow and/or disposal sites required?

Yes _____ No X

13. Are there potential relinquishments and/or abandonments?

Yes _____ No X

14. Are there any existing and/or potential airspace sites?

Yes _____ No X

15. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if district proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

Right of Way Lead Time will require a minimum of 20 months after we receive first appraisal maps, utility conflict maps, and the necessary environmental clearance and freeway agreements have been approved and obtained. Additionally a minimum of 12 months will be required after receiving the last appraisal map to Right of way for certification.


RIGHT OF WAY DATA SHEET

16. Is it anticipated that Caltrans will perform all Right of Way work?

Yes X No

Evaluation Prepared By:

Right of Way:

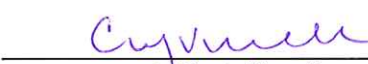

Jason Verduzco

Date

12/13/11

Reviewed By:

RW Project Coordinator:


Cindy Vincelli

Date

12-14-11

I have personally reviewed this Right of Way Data Sheet and all supporting information. I certify that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and I find this Data Sheet to be complete and current.

RECOMMENDED FOR APPROVAL



LISA HARVEY,
Senior Right of Way Agent
Project Delivery Branch
Redding

12-15-11
Date

APPROVED:



KAREN HAWKINS
North Region Right of Way Manager
Eureka/Redding

12/15/11
Date

Mini-Preliminary Environmental Analysis Report

Project Information

District 02 County SHA Route 5 Post Mile 2.0/R12.0 EA 02-4C402

Project Title: Shasta 5 Gap Closure.

Project Manager Phil Baker Phone # 225-3180

Project Engineer Chris Gaido Phone # 225-3473

Environmental (Manager) Office Chief Chris Quiney Phone # 225-3174

Environmental Planner Generalist André Benoist Phone # 225-3302

Environmental Setting:

The project area includes the land within the right-of-way of Interstate 5 (I-5), beginning at the City of Anderson and extending north to the southern limits of the City of Redding.

Project Description

Purpose and Need:

Efficient traffic operations on Interstate 5 are diminished by 5 existing interchanges that are in close proximity to each other. I-5 was constructed in the mid-1960's with one full interchange and 4 partial interchanges all within 3 miles of each other. The conditions are further complicated by a rolling mainline profile (which limits sight distance at the ramps), and 13% truck traffic. These factors combine to reduce the operational effectiveness of the existing 4-lane freeway in the Anderson/Redding Corridor. In addition, a major truck stop is adjacent to the sixth interchange in the corridor with significant amounts of merging big rig trucks that are longer and slower than other vehicles.

The area adjacent to the corridor has significant development potential that will only add to the existing traffic inefficiencies. Level of Service (LOS) is projected to drop below route concept of C/D by 2030 for the entire 7-mile gap between existing 6-lane freeway segments.

To address the need and meet the purpose, this project would:

- Improve operations on Interstate 5 by reducing merge conflicts
- Reduce congestion
- Provide LOS C in year 2030
- Improve safety for users and workers
- Construct the project while costs are low

Attachment J
Preliminary Environmental
Assessment Report

Description of work: The California Department of Transportation (Caltrans) proposes to add a third lane in each direction to I-5 within the project limits to create a 6-lane freeway. This improvement would match existing improvements north and south of the project site. The additional lane may be added to the inside (median side) or to the outside of the existing roadway. Completion of the project will require clearing, grading, road and bridge widening, and guardrail and drainage improvements as needed.

Anticipated Environmental Approval

CEQA

☒ Initial Study/ Negative Declaration

NEPA

☒ Categorical Exclusion

This is a STIP project that will include both State and Federal funding. It is recommended this project prepares an *Initial Study/Negative Declaration* to satisfy the requirements of CEQA. This project may qualify for a *Categorical Exclusion* under NEPA. Changes in work scope, project limits, or resource findings within the study area, could create additional impacts not addressed in this PEAR and may require additional time to complete the appropriate studies.

Summary Statement

Some of the proposed alternatives will require additional right-of-way in a few locations. There is a low potential of encountering archaeological or biological resources whether widening occurs to the inside or outside of the roadway. There is a potential for Aerially Deposited Lead (ADL) in adjacent soils, and a potential for hazardous waste sites within the project limits. A noise study should be prepared to consider the potential for noise increases to sensitive receptors within the project limits.

An *initial study* should be prepared to satisfy the requirements of CEQA. The purpose of the *initial study* is to evaluate and disclose the potential effects of the proposed project on the environment. Based on the current workload and existing resources available, it is expected that the environmental process will take 12 months to complete. Assuming that no hazardous waste sites are encountered and project-related impacts are determined to be *less than significant*, the *initial study* should result in a *Negative Declaration*, meaning no significant effect on the environment.

Bridge widening and drainage improvements to creeks and streams, will require permits from State and Federal agencies such as: the Army Corps of Engineers, the Department of Fish and Game and the State Water Board. Approximately 12 months should be provided between PA&ED and RTL to allow time for the permit process.

Special Considerations

Environmental Document: It is recommended that an *Initial Study* is prepared to satisfy the requirements of CEQA. This project would connect two six-lane segments and would create a full 6-lane freeway from the City of Redding to the City of Anderson. The initial study should consider all of

the sections contained in the CEQA initial study checklist. Technical studies may be required for *Air Quality, Hazards and Hazardous Materials, Hydrology/ Water Quality and Noise*.

Disclaimer

This report is not an environmental document. Preliminary analysis and determinations are based on the project description provided in this report. The discussion and conclusions provided by this mini-PEAR are approximate and are used to estimate the potential for probable effects. The purpose of this report is to provide a preliminary level of environmental analysis to supplement the Project Report/Project Study Report. Changes in project scope, alternatives, or environmental laws will require a re-evaluation of this report.

Reviewed by:


Chris Quiney, Interim Environmental Branch Chief

Date: 12/8/11


Phil Baker, Project Manager

Date: 12/8/11

Memorandum

*Flex your power!
Be energy efficient!*

To: Dale Widner-Project Engineer
Office of Advance Planning- District 2

Date: September 20, 2011

File: EA 02-4C402_
02-SHA-5
PM 2.0/R12.0

ISA # 11-2006

From: THOMAS J. GRAVES P.G./C.E.G.
ENGINEERING GEOLOGIST
Office of Environmental Engineering-North Region
District 2 Hazardous Waste Unit

Subject: Initial Site Assessment- SHA-5 6 Lane, Anderson to Redding Widening.

A hazardous waste assessment has been conducted regarding the above referenced project. The project proposes widening Interstate 5 to 6-lanes from the limits of the previous Cottonwood Hills project to the South Redding project. Six bridges will be widened as needed. Based on the current proposed project scope, the following Hazardous Waste issues were considered:

- **Lead Containing Paint (LCP)-Bridges:** There may be LCP on any exposed metal portions of the bridge structures. If lead is present, Special Provisions should be included in the Contract to provide a Health & Safety Plan for workers and a "Compliance Program" as noted in Section 1532.1, "Lead" of the Construction Safety Orders. The Special Provisions should also address appropriate removal if necessary, temporary storage, testing, and transportation to an appropriate disposal or recycling facility. In addition, the Resident Engineer should have the contractor provide written documentation that recycling or disposal facilities acknowledge the potential for lead on the material received.
- **Asbestos Containing Material (ACM)-Bridges:** Based upon past history of similar structures there is potential that ACM could be present in shims within the guardrail assembly, joint filler material, abutment joints, and/or expansion joints of these bridges. If there is any disturbance of these materials-removal and management of ACM shall be performed by a contractor who is registered Asbestos Contractor with CALOSHA.

The asbestos NESHAP, 40 CFR Part 61, Subpart M, regulations does require written notification of demolition or renovation operations of structures regardless of the

Attachment K
Initial Site Assessment

presence or absence of asbestos. The contractor should be required to notify the California Air Resource Board- Compliance Division, 2020 'L' Street, Sacramento, CA 95814 under NESHAP, 40CFR Part 61, and California Air Resources Control Board rules. A copy of the notification form and attachments should be provided to the Engineer prior to submittal to the Air Resource Board. Notification should take place a minimum of 10 days prior to the beginning of work.

- **Treated Wood Waste (TWW)-** Treated wood is present within the project limits in the form of MBGR and sign posts. Treated wood waste (TWW) (guard rail posts, sign posts, crib walls, etc.) may not be relinquished to the contractor and must be disposed of at an appropriately permitted disposal facility or may be reused on the originating project in a manner consistent with the intended use for the preservative. In addition to disposal, regulations specify the manner in which TWW must be stored while awaiting disposal. If TWW will be generated during this project, contract specifications must be prepared to address its disposal.
- **Thermoplastic/Paint Stripe/Pavement Marking** - Thermoplastic paint may contain lead of varying concentrations depending upon color, type and year of manufacture; the removal of any stripe/markings concurrent with the removal of existing AC, will require a lead compliance plan. If yellow thermoplastic will be removed *as a separate operation* SSPs to address hazardous waste (CCR Title 22) regulatory requirements will be required. This Office and the District 2 Office Engineer can assist in providing these SSPs.
- **Aerially Deposited Lead (ADL)-** Lead-contaminated soil may exist within the highway shoulders due to the historical use of leaded gasoline. The only way to approximate the level of ADL contaminated soil is by sampling and testing the project area. This will require a Preliminary Site Investigation (PSI) task order under the North Region Hazardous Waste Site Investigation Contract- 03A1368. Depending on the test results, soil on the project may have to be managed as a hazardous waste in compliance with State and Federal laws. Non-hazardous levels of ADL within the shoulders will still require a Lead Compliance plan.
- **Naturally Occurring Asbestos (NOA)-** A geologic evaluation regarding Naturally Occurring Asbestos (NOA) was conducted within the project limits. This evaluation included a review of geologic maps and reports including data prepared by the California Geological Survey (CGS) and the United States Geological Survey (USGS), previous studies conducted by Caltrans and their consultants, and a field inspection of the geology in the project area. The evaluation does **not** indicate the presence of altered ultramafic bedrock, alluvium derived from ultramafic rock, and other rock commonly associated with NOA.
- **Cortese List-** The proposed project area is not within or impacting any site listed on the California Department of Toxic Substance Control's List of Hazardous Waste Sites (also known as the Cortese List).

It is recommended that a Site Investigation be conducted on both bridges to determine NESHAP and CALOSHA, and soil disposal requirements; and to assist in the preparation of the contract standard and special provisions. This will be conducted by a task order under the North Region- Hazardous Waste Site Assessments & Surveys Contract. The results could be available within 1-2 months once initiated and will cost approximately \$15,000-25,000 depending on the final scope of work. It is estimated that preparation and oversight of this task order will require approximately 200 hours of Office of Environmental Engineering- North Region staff time.

Hazardous Waste Support Costs

WBS Activity		Hazardous Waste Staff (Hours)			Consultant Costs (\$)		
165.10.50	Perform Preliminary Site Investigation for Hazardous Waste	200			\$25,000		
235.10.15	Perform Detailed Site Investigation for Hazardous Waste (THIS TASK MAY NOT BE NECESSARY)						

Questions or comments may be directed to me at 530-225-3173.

cc: PBaker- D2 PM

APPENDIX E

Long Form - Storm Water Data Report



Dist-County-Route: 02-SHA-5
 Post Mile Limits: PM 2.0/12
 Project Type: New Construction (add lanes)
 Project ID (or EA): 02-0002-0191/4C402K
 Program Identification: 20.XX.075.600
 Phase: ☒ PID
 ☐ PA/ED
 ☐ PS&E

Regional Water Quality Control Board(s): Central Valley

Is the Project required to consider Treatment BMPs? Yes ☒ No ☐
 If yes, can Treatment BMPs be incorporated into the project? Yes ☒ No ☐

If No, a Technical Data Report must be submitted to the RWQCB
 at least 30 days prior to the projects RTL date.

List RTL Date: _____

Total Disturbed Soil Area: 79 Risk Level: 2

Estimated: Construction Start Date: 5/1/18 Construction Completion Date: 10/30/19

Notification of Construction (NOC) Date to be submitted: _____

Erosivity Waiver Yes ☐ Date: _____ No ☒
 Notification of ADL reuse (if Yes, provide date) Yes ☐ Date: _____ No ☒
 Separate Dewatering Permit (if yes, permit number) Yes ☐ Permit # _____ No ☒

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Oscar Cervantes 1-20-12
 Oscar Cervantes, Registered Project Engineer Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Phil Baker 1-26-12
 Phil Baker, Project Manager Date

Jeff Steffan 1-24-2012
 Jeff Steffan, Designated Maintenance Representative Date

Ron Flory 1-25-12
 Ron Flory, Designated Landscape Architect Representative Date

[Stamp Required for PS&E only] Wes Faubel 1-26-12
 (Wes Faubel), District/Regional Design SW Coordinator or Designee Date



Caltrans Storm Water Quality Handbooks
 Project Planning and Design Guide
 July 2010

Attachment L
 Storm Water Data Report

STORM WATER DATA INFORMATION**1. Project Description**

This project proposes to expand Interstate-5 to 6-lanes to connect the gap between existing 6-lane freeways from Anderson to Redding (PM-4.3/11.2) in Shasta County. The new lanes could be added either all in the median, or a combination of median and outside widening. Current median width varies from 60 to 84 feet, all unpaved and sloped to drain to the middle. The 60 foot median runs from PM-4.1/8.3, with an 84 median from PM-8.3/11.2.

Options for median treatment include:

Inside widening portion

- 36 foot all-paved median in “tent” section (water flows to the outside) where the existing median is 60 feet
- 36 foot all-paved median in “depressed” section (water flows to the middle) where the existing median is 60 feet
- 60 foot unpaved median in “depressed” section where the existing median is 84 feet

Outside widening portion

- 70 foot unpaved median in “depressed” section where the existing median is 60 feet

There are 7 pairs of bridges on mainline I-5 that will need to be widened to add the new lanes. Options for bridge widening include:

Inside widening portion

- Deck the entire median width (60 feet) between the bridges
- Widen each bridge by 17 feet towards the median

Outside widening portion

- Widen each bridge by 17 feet towards the outside

All existing pavement surfaces will be overlaid with 1 inch of open graded asphalt pavement. This report is based on the project widening all being done in the median which is the preferred alternative.

The total disturbed area (DSA) will be approximately 79 acres of which 50 acres will be due to exposed soil for construction activity in the median and around drainage locations. The other 29 acres, which may not occur, is for side slope grading. This project will add 36 acres of new impervious area due to lane and shoulder widening. The estimated existing impervious area is 65 acres. A portion of this project is within the City of Anderson Phase II Urban MS4 Permit area.

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

This project is within the Enterprise Flat hydrologic area (508.10) which has a watershed of 245,372 acres. This area includes the following water bodies: Battle Creek, Clear Creek, Cow Creek, Clover Creek and Sacramento River.

Clover Creek is listed by the Water Quality Planning Tool as being 303(d) listed for fecal coliform.

The Sacramento River is 303(d) listed for unknown toxicity and has EPA approved TMDLs for cadmium, copper, and zinc within the project limits.

It is unknown whether the project will require 401 water quality certification.

Topography

Based on topographic mapping the terrain is flat to rolling. The elevation range is 400 feet to 650 feet above mean sea level.

Land Use

Adjacent land use is urban, residential, commercial, and farming.

Climate

The climate is mild with temperatures in the low 50s in January to highs in the upper 90s in July. The average monthly precipitation ranges from 0.16 inches in July to 7.9 inches in January and falls primarily between the months of October and April.

Soil Characteristics

Based upon a desk top review of native project soils as from the USDA Web Soil Survey the predominate project soils are classified as Hydrologic Group B. Soil details are as shown in the attached mapping and reports. Soil types and characteristics will be confirmed during the PAED project phase.

Right of Way Requirements

Acquisition of Right-of-Way for BMPs will not be required.

Aerially Deposited Lead (ADL)

Lead-contaminated soil may exist within the highway shoulders due to historical use of leaded gasoline. The presence of ADL soils will be determined during the PAED project phase.

Project Risk Level Determination

At the present time it is presumed the project is at Risk level 2 with a medium sediment risk and High receiving water risk.

Measures for Avoiding or Reducing Potential Storm Water Impacts

Surface water is present year round in the Sacramento River. Potential storm water impacts for this project are sediments in storm water runoff from the proposed lane widening, bridge work and vehicle fluids from construction equipment. Another source of potential impacts is the modification of existing culverts. Additional drainage design information will be available during PAED Phase.

Disturbed areas will be stabilized in accordance with the recommendations of the District Landscape Architect. The project design should allow the ease of maintaining all best management practices (BMPs), and they should be scheduled or phased to minimize soil-disturbing work during the rainy season.

Existing Treatment BMPs within the Project

There are biofiltration swales in the median and the ones located between PM 8.3 to PM 11.2 will be perpetuated. Also the biofiltration swales located at catch points in the outside lanes will be maintained.

3. Regional Water Quality Control Board Agreements

There are no negotiated agreements with the CVRWQCB for this project.

4. Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

The proposed improvements will increase the impervious area within the project limits. It is anticipated the increase in impervious area will have a negligible effect on the Hydraulic Capacity of the receiving drainage system. The increase of 36 acres compared with 245,372 acres for Enterprise Flat hydrologic area is negligible on a watershed basis.

This project will evaluate specific discharge location pre and post construction hydrographs during the project design phase. The final design will incorporate low impact design features as feasible to reduce project runoff to the pre construction condition. These features may include maintaining existing vegetated areas, drainage facilities that mimic the existing drainage pattern of the area, grade slopes to blend with the natural terrain, and incorporating localized infiltration features to reduce project runoff.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

Disturbed slopes in the median will be stabilized in accordance with erosion control plans prepared or approved by the District Landscape Architect. It is anticipated this project will

require the use of pre and post construction erosion prediction methods to evaluate and design the erosion control features.

As noted the existing dirt median from PM 4.3 to 8.3 will be paved.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

This project will discharge water into existing biofiltration swales that run parallel to the highway along the west and east side of the highway. The swales will ultimately discharge into the Sacramento River. Project may discharge water into the Anderson Cottonwood Irrigation District (ACID) canal which a portion traverses within the project limits. Existing culverts will be extended / modified to accommodate lane widening. Culverts will have Flared End Sections (FES) and rock energy dissipaters replaced/added where needed.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

Existing vegetation will be preserved to maximum extent practicable. Environmentally Sensitive Area (ESA) fencing will be installed where necessary to protect vegetation during construction.

5. Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

The Targeted Design Constituents for the 303(d) Sacramento River are copper and zinc.

The treatment BMP strategy will attempt to perpetuate existing treatment BMPs and deploy additional BMPs to infiltrate pavement runoff to the maximum extent feasible. Additional biofiltration strips and swales and infiltration devices will potentially be deployed to treat remaining runoff. This strategy is estimated to treat 100% of the new impervious area while maintaining existing treatment of the pre-project impervious area.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

As noted biofiltration swales already exist along the west and east side of I-5. During the PAED phase the feasibility of providing additional swales will be evaluated.

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

Dry Weather Flow does not exist.

Infiltration Devices – Checklist T-1, Parts 1 and 4

Infiltration is potentially feasible based on the project soil types and will be evaluated further during the PAED project phase if necessary.

Detention Devices, Checklist T-1, Parts 1 and 5

Two private detention basins exist on the west side of southbound I-5 at PM 7.6 and 7.9. The feasibility of additional detention devices will be evaluated during the PAED phase

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

There are no TMDLs for trash in the area. GSRDs are not feasible.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

Traction sand is not used along this segment of I-5.

Media Filters, Checklist T-1, Parts 1 and 8

Media filters will be evaluated during the PAED phase. The biofiltration swales/strips, which already exist, are the preferred alternative for the water quality treatment.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

The project contains no Critical source Areas as defined by the PPDG. MCTTs are not feasible.

Wet Basins, Checklist T-1, Parts 1 and 10

The project contains no site where sufficient base flows are present to support a Wet Basin. Wet Basins are not feasible.

6. Proposed Temporary Construction Site BMPs to be used on Project

This project is planned to be constructed over two construction seasons with construction continuing as feasible during the winter rain months. The preliminary Risk Level for the project is Risk Level 2 using the GIS Map Method in accordance with Appendix 1 of the 2009 Construction General Permit.

Temporary construction BMPs will be deployed under a contractor prepared SWPP approved by the engineer. Sediment perimeter controls, tracking controls, and concrete waste management are potential BMP bid line items. Other items will be identified during later

project phases. Construction BMP cost has been estimated at 2.75% in accordance with current PPDG estimating guidance.

Completion of the attached Construction Site BMP Consideration Form documents
Construction Division Concurrence in accordance with current North Region Directives.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain Inlet Stenciling will be included if located in areas accessible to bicycle and pedestrian traffic. At this point in time it is too early to determine if Maintenance pullouts will be constructed. This will be looked at during later project phases.

Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Construction Site BMP Consideration Form
- Web Soil Survey
- Soil Area Map
- Rainfall Erosivity Factor Calculator for Small construction Sites

Supplemental Attachments

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- BMP cost information from: Project Planning Cost Estimate (PPCE) during PID and PA/ED project phases; Preliminary Engineer's Cost Estimate (PECE) for PS&E project phase
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- Checklists T-1, Parts 1–10 (Treatment BMPs) [only those Parts that are applicable]